

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

PROVISION FOR EXPENSES IN WORKMEN'S COMPENSATION
PREMIUMS—JOSEPH H. WOODWARD.

VOL. III, PAGE 140.

WRITTEN DISCUSSION.

MR. ALBERT H. MOWBRAY:

Mr. Woodward points out that although there has been little discussion, except in life insurance, of the theory upon which premiums should be loaded to provide for expenses, the practice seems to have followed the simple hypothesis that expenses should, in general, be assessed in proportion to the value of the insurance benefits provided. Mr. Woodward does not lay down at the outset of his paper the hypothesis which seems to him the true hypothesis, but does say in the closing paragraph of his paper where he answers the charge that the proposed change would be criticized as involving discrimination: "But the real test of discrimination is whether or not those fundamental principles of mutuality which enter into all insurance are violated. And the test of mutuality is that each insured shall be charged as exactly as possible with the value of the benefit in his policy plus his share of the expenses assessed *in the proportion in which he has contributed to produce them.*" (Italics mine—A. H. M.)

This major premise being admitted, the fundamental principles of Mr. Woodward's proposals do not seem open to attack. There has been in life-insurance circles not a little discussion as to the validity of this theory when carried to its full extent. That is, it has been claimed that new business is of advantage to the company and, therefore, the acquisition expense should, in part, be paid for by old policyholders as well as by new policyholders. This problem, however, does not present itself in compensation insurance, and if we might be disposed to theorize on this subject we have, as Mr. Woodward points out, a practical competitive test which seems to determine upon what theory our expenses must be apportioned. That test lies in the possibility of self-insurance, open under the laws of most states, and, as Mr. Woodward points out, if the method of expense distribution is such that an undue proportion is placed upon a large employer, he will not insure.

So far as discussion has been given to the question of loading in compensation premiums this hypothesis seems to have been followed. For example, the Joint Conference of 1915 provided a graduated expense loading according to state in recognition of the fact that the expense in the different states was not proportional to the pure premium costs.

Following out this hypothesis Mr. Woodward analyzes expenses into four general divisions. There might possibly be a disposition on the part of some critics to quibble somewhat with this and point out, for example, that in the textile industry a single employee operates many machines, upon all of which there are exposed gears, and that the accident prevention work in this classification is, therefore, much more costly than would be the accident prevention work in some other classifications which carry higher rates and that the expense is proportional neither to the office premium, the pure premium, payroll or number of policies. For myself I do not believe serious objection can be taken to Mr. Woodward's analysis, which seems as complete as it is practicable to go.

For the sake of clearness and understanding of the subsequent work, it should perhaps be again emphasized that the percentages of expense as distributed in Table A on page 141 are with relation to the gross premium. And 40 per cent. of the gross premium being 66 $\frac{2}{3}$ per cent. of the pure premium, Mr. Woodward's method of determining the standard charge per unit of payroll in his formula A_2 will perhaps be sufficiently clear.

Mr. Woodward uses the symbol p to represent the pure premium rate, and it should be clearly borne in mind that this refers, not to the basic pure premium, but to the actual pure premium for the state for which the rate is to be made after all modifications and adjustments of the basic pure premium have been made.

Mr. Woodward's table on page 144 is very interesting and illuminating as showing the inequity according to the hypothesis underlying his theory of expense distribution of our present methods. The table would have been more striking had he included a fifth column expressing the difference entering into the fourth column as a percentage of the gross rate appearing in the second column. I have done this with the following results for each of the pure premiums tabulated by Mr. Woodward:

Pure Premium.	Excess of Correct Rate over Rate by Flat Percentage Loading as Percentage of Correct Gross Rate.
.05	50.3
.10	31.6
.25	12.2
.50	3.1
.75	0.0
1.00	-2.5
2.00	-5.0
5.00	-6.9
10.00	-7.6

Mr. Woodward's second proposal includes use of a policy fee and is more complex than the first, but follows consistently with his fundamental theory and is, as he notes, a further elaboration of the first proposal. Again, in the comparison on page 147 his results might be more striking if there had been an additional column expressing the value of the difference as a percentage of the rate computed by his method.

The percentages are as follows:

DIFFERENCES IN COLUMNS (4), (7) AND (10) OF TABLE ON PAGE 147 AS PERCENTAGES OF P'.

Pure Premium.	$W=5.$ Per Cent. of (2).	$W=50$ Per Cent. of (5).	$W=500.$ Per Cent. of (8).
.05	93.9	68.1	43.7
.10	88.5	50.2	24.9
.25	75.2	25.5	6.8
.50	59.5	10.9	-1.3
.75	48.7	4.6	-4.4
1.00	40.6	0.9	-6.2
2.00	22.6	-4.7	-8.5
5.00	5.5	-8.4	-9.1
10.00	-2.2	-9.8	-9.6

It is perhaps fair to say that the use of minimum premiums tends to make up the insufficiency of the charges on the smallest risks. The overcharge on the large high rated risks are not, however, taken care of on that basis.

Mr. Woodward points out the arbitrary character of the minimum premiums now being charged, and the way in which the loading for expense according to this theory will to a large degree avoid the necessity of arbitrary minimum premiums. In this connection it is perhaps well to note that the subject of minimum premiums is now under consideration after the minimum premiums determined by the recent Augmented Standing Committee has been subject to severe criticism by several insurance departments. Mr. Woodward's work in this connection, therefore, is very timely.

MR. VIRGIL M. KIME:

Mr. Woodward's article deals with a live subject. He discusses in an interesting manner one of the important problems connected with rate making for workmen's compensation insurance.

The paper is, I take it, largely suggestive. The author does not, apparently, propose for immediate adoption any particular method mentioned by him. It would be presumptuous, with our present knowledge of workmen's compensation insurance, to take in a discussion of his paper a definite dogmatic stand for or against

the loading methods reviewed. I shall, therefore, limit myself to what seem to me to be several important considerations in connection with the systems of expense loading described.

Mr. Woodward states that the expenses of providing workmen's compensation insurance may be analyzed into four general groups; those proportional to the office premium, to the pure premium, to the insured payroll, and to the number of policies issued, respectively. He then proceeds to derive formulas with illustrations, first assuming that expenses are allocated to the first three divisions only, and second that they are allocated to the four divisions. The result is, in either case, a system of expense loadings decreasing in proportion to the pure premium as the size of the pure premium increases.

Mr. Woodward's figures are illustrative in that he uses personal judgment in allocating the expenses into the various groups. Were either of his formulas used in practice, an investigation by the carriers of the incidence of their expenses would be necessary. In no event, however, is it at all likely that we should be able to effect an expense analysis without the use of considerable judgment.

Mr. Woodward indicates it to be a sound fundamental principle that where there is a doubt as to the basis on which expenses should be assessed, the doubt should be resolved by allocating as much as is reasonably possible in proportion to the value of the benefits insured. In classifying any element of expense, it is necessary to determine what causes a variation of that item of expense. If it varies with the number of policies, its classification is obvious. It is apparent, however, that the analysis problem is not nearly so simple. Who can determine, under general administration, for example, how much should be proportional to the number of policies, how much to payroll and how much to pure premium?

Every insurer must spend a certain sum for the underwriting of a policy, for the printing of the policy forms, for the entering of the policy on its books, for the recording of the payment of premiums, for the sending to the policyholder of all necessary forms and instructions, for the making of an inspection and a payroll audit. Obviously, there is a cost of each of these operations attaching to the very smallest policy. The question to be solved is simply where to draw the line between the constant cost, on the one hand, and the costs varying with the payroll, office premium or pure premium, on the other hand. Conditions will vary among the different carriers. The proper constant cost for one individual carrier will not necessarily be the proper one for another. Although a system of expense loading giving to carriers as a whole a proper aggregate for expenses can obviously be devised, does it follow that the same factors applied to each individual carrier will provide for its expenses without considerable excess or deficiency? We might conceive two carriers, one with a large number of small policies, the other with about the same volume of business in total

but with a small number of large policies. We might further consider that a loading factor proportional to the number of policies has been determined quite high. Is it not possible that the carrier of the large policies would find a considerable deficiency in his expense loadings?

It is necessary that a system of loadings be so devised that each carrier will collect for expenses a reasonable provision for such expenses. A cursory inspection of Schedules "W" indicates that even where the aggregate expenses are substantially the same percentages of the premium, there may be as between one carrier and another a considerable variation in the makeup of these aggregate expenses. A modification of the present expense loading scheme should not be attempted without consideration of these variations.

We should bear in mind that either of the plans outlined by Mr. Woodward is based upon the correctness of the pure premium, which, as he states, includes such factors as increasing cost due to industrial activity, due to age of act, etc. The recent conference on compensation rates gave quite a bit of consideration to the use of a graded expense loading in connection with a graduated differential. A combination of a single differential and a flat loading gave rates not varying considerably from those resulting from the use of a graduated differential and graded expense loading. If the errors arising out of the use of our present system of single differentials are substantially counterbalanced by the use of flat expense loadings our practical results are substantially equitable. A refinement of our method of loading must, consequently, proceed hand in hand with a refinement of our differential method and with a careful study of the actual incidence of expenses, not only in the aggregate, but with respect to individual carriers.

The use of a factor based upon the number of policies can be defended on many grounds. It might offer a solution, for example, of the minimum premium question, the minimum premium to consist of the premium produced by a certain minimum payroll together with a constant factor. On the other hand, there are many and manifest objections to the use of a constant factor, particularly if it be stated in the policy contract as a constant. The public has been educated under certain lines of insurance to look askance at any evidence of discrimination. Can we assume that the insuring public would acquiesce in any plan whereby the small policyholder would have to pay more for its protection per unit of payroll than would his large competitor?

If a constant factor per policy is to be used, its justification will rest upon the fact that a large part of it will be due to the actual cost of putting the policy in the hands of the assured and of carrying the policy on the books of the insurer. These expenses are incurred to a considerable degree whether the policy be carried to expiration or not. Would not the use of a constant factor make necessary a change in our methods of computing return premiums on cancellations before expiration?

The present system of expense loading results in a simple method of statement of premium. This should be departed from only for practical reasons.

Life insurance affords an interesting and instructive illustration of some of the principles involved. Loadings have usually in this country consisted of a percentage of net or gross premium or a percentage of net premium plus a constant per \$1,000 insurance. Insurance departments have not looked with favor on a system of policy fees or constants. If life insurance with its long period of development and refinement has not found it practicable to vary premium rates by size of risk, we should proceed cautiously in the new compensation field.

I should not wish the above to be construed as arguments against Mr. Woodward's suggestions. The intention is merely, rather, to mention a few of the problems which must be considered along with the subject matter of his paper.

MR. CHARLES G. SMITH:

Mr. Woodward's logical and clear exposition of the problem of expense loading in workmen's compensation premiums records a distinct advance in the theory of rate-making.

The demand for a solution of the problem which Mr. Woodward has attacked may perhaps be traced back to the enactment of statutes providing for the approval of rates as to adequacy by supervising officials. As there is no absolute standard of adequacy which can be applied in advance, such officials are forced to rely upon composite or built-up rates; consequently they must scrutinize very closely each element entering into the finished rate. The general rate revisions have been of a semi-public character, and much attention has necessarily been given to the equitable treatment of the various industrial groups which are effected by compensation laws.

There is a more or less well-defined impression in the minds of many engaged in the business of workmen's compensation insurance to the effect that strict equity demands some method of loading which has regard for the small overhead cost of handling large amounts as compared with small amounts. Hitherto this idea has found its outward expression only in the present rather crude minimum premium device.

Whatever efforts have been made up to the present time looking toward a quantitative analysis of the problem of equitable expense loading have been hampered by the non-existence of reliable statistical data bearing on the various elements entering into the cost of writing policies and keeping them on the books.

I have little suggestion to make regarding the amounts of the different items of expense enumerated by Mr. Woodward and the proportions according to which he allots them to gross premium, pure premium, payroll and number of policies, since these are in-

tended mainly for illustration and depend largely upon individual judgment. These items could not be authoritatively determined except through a statistical investigation.

Mr. Woodward allocates acquisition expense so-called in proportion to gross premiums, since this expense is usually incurred as a percentage of such premiums. It might be questioned whether this is a valid reason for so allocating the whole of the item in question. The term "acquisition expense" has recently been the subject of considerable discussion, and there seems to be some ground for believing that commissions constitute only a part of the 17½ per cent. generally allowed, the remainder representing the cost of various kinds of "service" received by the assured. If such is the case, would it not be logical to allocate commissions to gross premiums, and the rest of the "acquisition cost" to pure premiums or payroll or in some proportion to both? In other words, perhaps these items ought to be allocated, not in proportion to payments to field representatives, but in proportion to the cost of service rendered.

Similarly it might be considered logical to allocate "adjustment expenses" in proportion to the number and not the amount of claim payments. This being impossible in practise, perhaps an approximation could be reached by a division of this expense between pure premiums and payroll.

One thought which impressed itself on me very forcibly on reading Mr. Woodward's paper is that some attention might well be given to the terminology which is springing up in the compensation field. The fact that a writer of Mr. Woodward's clarity of expression finds it necessary to pause as he does on page 144 and devote eight lines to an explanation of what he means by the words "pure premium" in this particular discussion is an index to the situation.

It is unfortunately true that we have "pure premiums" of many kinds, which are often mentioned indiscriminately: "basic" pure premiums, "experience" pure premiums for various states; "selected" pure premiums, found in the basic manual, not only containing the pure loss cost but reflecting the application of so-called "law-differentials," and of a factor to neutralize the effect of schedule rating. Then we have "reduction factors," factors for increased "industrial activity," "increased cost due to the age of the act;" we have "expense loading," covering some items perhaps not properly classed as expense, and applied to an imaginary premium which is not a "pure" premium (having concealed within it several factors beside actual loss experience), and which has no name; we have "acquisition expense" which is often accused of being a misnomer; we have Schedule P, Schedule R, Schedule W, Schedule Z, and even Schedule ZZ, whose names give no clue to their character and functions. Many other illustrations could be given if time permitted.

Many of the terms now used in compensation insurance have

sprung up haphazard in the necessity of the moment, and have received recognition without much consideration, for lack of something better. Those who have occasion to participate in the conferences which deal with the various phases of workmen's compensation insurance will probably not deny that there are times when not all of those present appear to be speaking the same language.

Perhaps the terms now in use might be standardized and defined with some precision, with proper regard for their inter-relation and for the future introduction of new terms.

It seems quite possible that unless more constructive effort is exerted in the development of a proper terminology in compensation insurance, the members of the statistical and actuarial profession will experience an ever increasing difficulty in discussing their problems and in presenting the results in a convincing manner to their non-technical associates.

ORAL DISCUSSION.

MR. E. H. DOWNEY: I wish to remark what may not be known to all the members here, that the Pennsylvania Bureau has adopted and put into effect on August 1 last a graduated compensation rate which conforms very closely to Mr. Woodward's proposal, except with respect to the policy fee; that is, the expense is divided into three elements. One element, proportionate to the gross rate, a second which is proportionate to the pure premium and a third which is a flat or a constant per hundred dollars of payroll. The effect of this scheme is to reduce the premium rate on the high rated classifications and to increase it upon the low rated classifications. The 10 cent pure premium produces a 27 cent rate on the Pennsylvania scheme.

MR. I. M. RUBINOW: Mr. Chairman, without discussing the details of Mr. Woodward's paper, I just want to add a word to emphasize the present tremendous importance of the subject, not only in graduating the premiums according to the level of the rates, but also as to the size of the risks. That is a consideration which Mr. Mowbray casually mentioned in his discussion but didn't sufficiently emphasize, I think, and that is that there is a very serious danger that a level expense ratio, which doesn't take into consideration the size of the risk, is going to act as a deterrent to the larger risks and force them to remain uninsured altogether. Now, that is not a theory but an actual statement of facts as I happened to find them in one of the western states in connection with some consulting work I have been doing—that the large risks (and it happened to be a state where all the substantial risks were very large indeed) were very much opposed to paying a rate of loading which they figured in dollars and cents would produce a sum which

they thought was unjustified in running the business of their risks. And the result, as far as I know, was that most of those risks remained uninsured.

You see, there is, after all, if you have no compulsory insurance—and practically none of our states have absolutely compulsory insurance, because there is always the alternative of self-insurance left in the laws, there is always the alternative between insurance and self-insurance or non-insurance, and the large risks which do run their business on strict business principles, with cost accounting, are going to wait and select the one of the two alternatives which is cheaper, and in that way the element that is decisive is the cost of running a benefit compensation department within the industrial undertaking. Practically one might say that anywhere from \$5,000 up is the cost of running a compensation department. Now, \$5,000 is a loading on the risk of about \$12,000, and there are very many risks in this country which are charged \$12,000 or over for their compensation insurance. So practically every one of those risks must consider the alternative of self-insurance, and the larger the risk, the stronger is the argument for self-insurance.

Now, besides the business point that in that way compensation insurance carriers may be deprived of the most substantial and profitable part of their business, there is also to be considered the general social point of view. I think this Society is particularly a proper field to emphasize the general social point of view of insurance. No matter how large a risk—I don't care how large a risk—self-insurance is undesirable on social principles. There is no absolute guarantee and permanency in any sort of an investment except possibly a Liberty Bond. A mine that is running at a profit of \$1,000,000 a year may become exhausted long before the compensation payments have all been paid. So that there is a very serious social problem involved which I think ought to get the consideration of supervising officers just as much as a serious business problem involved things that must get the consideration of insurance enterprises, that is, that loadings must be graduated according to the size of the risk.

MR. JOSEPH H. WOODWARD:

(AUTHOR'S REVIEW OF DISCUSSIONS.)

I shall utilize my privilege of preparing a reply to these most interesting discussions almost wholly in commenting upon the points raised by Mr. Kime. This is not for the reason that I am insensible to the careful thought which the other reviewers have given to the subject but because, apparently, they have been so fully in agreement with the main principles developed in the paper that reply is uncalled for. Concerning Mr. Kime's discussion perhaps I should say that, in a general way, the matters which he

brings up were intentionally left untouched in the paper as it seemed desirable to present the subject in more or less academic form, ignoring for the moment certain inter-related problems the introduction of which might have tended to obscure the main issue.

Mr. Kime points out the difficulties of undertaking a true allocation of expenses. These difficulties are, of course, obvious. They do not, however, constitute an objection to a plan which, imperfect as it may be from the standpoint of ultimate equity, is nevertheless an improvement over existing conditions. For practical work we are dealing with questions of *relative*—not *absolute*—precision.

Mr. Kime points out that an examination of Schedule W shows "that even where the aggregate expenses are substantially the same percentages of the premium, there may be as between one carrier and another a considerable variation in the makeup of these aggregate expenses. A modification of the present expense loading scheme should not be attempted without consideration of these variations." If by this it is intended to be suggested that different expense loading formulae should be allowed to different individual carriers, based upon the experience of such carriers, I fear that I cannot concur with Mr. Kime's conclusions. A better adjustment of expense loading as between the high and low-rated risks and the large and small risks would tend to largely reduce these variations.

Mr. Kime introduces the moot question of the graded versus the constant differential as related to the loading formula. Referring to the recent rate conference, he says: "A combination of a single differential and a flat loading gave rates not varying considerably from those resulting from the use of a graded differential and graded expense loading." There is no doubt that the use of a constant differential in conjunction with a constant loading produces two sets of systematic errors in the rates, which, being in opposite directions, tend to counteract each other. As to the equity of the results actually obtained by this process there is good ground for difference of opinion. The prevalence in the New York exception sheet of high-rated classifications tends, in my judgment, to show in a very concrete way that the abnormally heavy loading on the high-rated classification was, in the case of New York State, not sufficient to offset the errors produced by the use of a constant differential. However this may be, it would appear to be unsound practice to trust that two errors in opposite directions, both of unknown magnitude, will even approximately balance each other throughout the wide range of values quoted in the rate manual.

In discussing possible objections to the introduction of a constant or policy fee into the actual premium Mr. Kime says: "Can we assume that the insuring public would acquiesce in any plan whereby a small policyholder would have to pay more for its protection per unit of payroll than would his large competitor?" The answer to this question depends entirely upon whether there is reasonable justification for such a condition. There are practically

no commodities which are dealt in commercially where retail prices are not higher per unit than are wholesale prices. To what extent insurance ought to be an exception to this well nigh universal rule depends upon the reasonableness of the arguments in any particular case.

Mr. Kime raises the interesting question of whether or not a constant addition to the premium might not make it advisable or necessary to change the customary methods of computing return premiums on cancellations before expiration. This is on the theory that initial expenses are largely incurred whether or not the policy is carried to expiration. As a practical matter, it does not seem to me that it would be necessary or desirable, certainly at first, to make any change in the customary methods of computing return premiums. It has never been considered good practice in this country to make any deduction from the premium reserve on the ground of initial expenses, and wherever cancellation is made on the instance of the company the full unearned premium should be returned.

"The present system of expense loading," says Mr. Kime, "results in a simple method of statement of premium. This should be departed from only for practical reasons." I am not sure whether this statement is intended to be for or against a departure from the simple method alluded to. Assuming, however, that it is intended to be in support of things as they are, my answer would be that the "practical reasons" sought by Mr. Kime not merely exist but appear to be growing daily more imperative.

A comparison with the methods followed in life insurance is introduced and perhaps it is well to say something on this point. The most widely accepted American method of loading life insurance premiums is to load the premiums on various forms of policy by a percentage of the net premium for the form in question plus a percentage of the net premium on an ordinary life form for the same age. This has the effect of producing a relatively smaller expense loading on the higher premium forms of insurance, which is precisely the purpose intended to be served by both the formulæ given in the paper.

On the subject of policy fees Mr. Kime states: "Insurance departments have not looked with favor on a system of policy fees or constants." It is quite true that the policy fee has fallen into disrepute. It has most justly done so, however, since it has been subject to serious abuse, particularly in connection with industrial accident and health insurance, where it was used solely for the purpose of compensating agents and not with any view of securing greater equity in allocating the policy expenses. It was the practice to permit agents to retain the policy fees on any policies written by them, these sums in many instances being not even reported as part of the company's premium income. A condition of affairs was thereby created which offered special temptations to rebating

and other bad practices. Nothing of that sort could be alleged against the proposal made in the paper, and the sound and excellent reasons which have moved insurance departments to object to policy fees under other circumstances would not apply in this case.

Both Mr. Mowbray and Dr. Rubinow have emphasized the practical aspects of the expense problem as applied to the larger risks. While, of course, there are other elements involved in the consideration of whether or not a large employer will self-insure than the mere question of the expense loading in the premium, nevertheless, it would seem reasonable to suppose that a certain number of these large risks which were wavering between a decision to insure or not to insure would be favorably influenced by a more equitable assessment of the expenses. Dr. Rubinow points out the undesirability of self-insurance on social grounds, referring particularly to the lack of security for the payment of future installments of compensation where such payments run over a long term of years. Social welfare and the business profit of insurance companies are happily in accord on this problem, and, consequently, an active exploitation of the subject should almost certainly result in getting something done.

Mr. Smith raises some rather fine points in connection with the allocation of acquisition expense. This matter should, of course, receive careful consideration before any particular expense loading formula is adopted for practical use.

Mr. Downey mentions the interesting fact that Formula A, with suitable modifications in the constants, has already been adopted in Pennsylvania, where expenses are now assessed in three parts, one proportionate to the gross premium rate, the second to the pure premium rate, and the third a constant per unit of payroll. While it was not the purpose of the paper to urge immediate action, there would appear to be no good reason why a modified system of expense loading should not be adopted whenever the basic pure premiums may next be subject to revision.

Several of those discussing the paper have brought up the question of minimum premiums. It should, perhaps, be said that at the time the paper was written this subject had not become the extremely live issue which it has proved subsequently to be. While it is true that the adoption of a policy fee would be of material assistance in solving our difficulties in rating the very small risks, it seems to me that a word of caution should be given against expecting too much in this direction from this particular device. In addition to the proportionately greater expense of underwriting, issuing and maintaining a small policy, the difficulty in securing an adequate rate rests upon two other important considerations, (1) the practical impossibility of securing correct payroll statements upon these risks and (2) the excessive physical and moral hazard which it is generally believed that small risks as a class present. The weight of these two factors may prove so great as

compared with the weight of the expense factor that a solution of the problem purely along the lines of a re-assessment of expenses would not be satisfactory. What is needed is a greater volume of experience statistics showing loss ratios upon small policies taken as a class. This would enable the combined effect of the two factors above mentioned to be estimated and permit a solution of the matter more satisfactory than the more or less arbitrary solution which has recently been reached in several of the states.

GROUP LIFE INSURANCE AND ITS POSSIBLE DEVELOPMENT—
EDWARD B. MORRIS.

VOL. III, PAGE 149.

WRITTEN DISCUSSION.

MR. H. PIERSON HAMMOND :

The paper which Mr. Morris read before this Society in April last on Group Life Insurance is an exceedingly valuable addition to the material available on this subject, and inasmuch as a committee of the National Convention of Insurance Commissioners was appointed at St. Paul in August to look into the subject of group life insurance and make recommendations for appropriate legislation, I think the author should be accredited with the production of a very timely paper. This Committee of Insurance Commissioners, with such actuaries as may be associated with it, should have for consideration all the information such as appears in our *Proceedings*.

Mr. Morris has set forth his views so accurately that one can hardly find much to discuss argumentatively, and little to criticize. Then, too, the ground is so completely covered from the point of view of the insurance company and the underwriter that there is little that I can say, except possibly to add some thoughts from the viewpoint of the insurance department official whose business is that of supervising, and not producing.

First, of what are we talking? What is group insurance? I do not believe that Mr. Morris's article offers a definition other than the general definition, namely, "the insuring of the lives of more than one hundred employees of a common employer." I know in my recent paper on the subject which I read at St. Paul, I intentionally did not offer a definition, and in the discussion of the paper which ensued no one asked for one, although I have asked myself this question many times. It may be that the development of group insurance has progressed for so limited a time that a proper definition to-day would not be a proper one to-morrow. Nevertheless, I submit for your consideration and criticism that group insurance is that form of life insurance which is written on a blanket yearly renewable term contract under which all or practically all of the employees of a single employer are insured for amounts either dependable on or commensurate with their yearly wages, and for the benefit of those other than the employer having insurable interest in the employees.

I think this definition reflects what has become to be known in this country as "group life insurance." It is *life* insurance still, and in view of the present statutory regulations, will probably remain so for some time to come irrespective of the present methods of inspection and selection. To my mind, the economic development of group insurance contemplates first a form of contract, the effective gross periodical premiums for which in the case of the average group remain practically the same year after year, and secondly, an assurance to the employee and his dependents that his wages for a period of time after his decease will be paid to his dependents.

I am fully aware that this definition does not cover a blanket policy written on any form other than that of a yearly renewable term contract and covering persons not employed in the same or similar pursuits. A blanket life insurance policy on any other form, I suppose, could be termed a "group policy," but within the confines of the economic and social developments as it has progressed thus far in the United States, such a term so applied, would, to my mind, be a misnomer. I think we should, as far as possible, follow the definition in practice, and, if occasion arises now and then for digression, let the exception prove the rule.

The Question of Selection.

Under this heading Mr. Morris discusses two points of particular importance. First, he says:

"A frequent form of request is that in addition to the group insurance the employer be allowed to purchase additional insurance at group rates for limited amounts. Such a concession is a dangerous one, unless accompanied by the requirement of a medical examination, for there is bound to creep in a certain amount of selection against the Company; for poor risks who are unable to obtain insurance elsewhere, are encouraged to avail themselves of such an opportunity."

I think that companies writing group insurance should come to an agreement among themselves concerning this phase of the subject, and possibly other matters. If they do not, I am apprehensive that in addition to the question of adverse selection, there may be some statutory regulation in the not distant future which will more or less limit the group contracts and the benefits and privileges incident thereto. I agree that such a concession as stated above is dangerous, and for the reasons named, but is it not more dangerous because of the possible violation of the anti-discrimination laws? Jones and Brown, each 35 years of age and married, live in adjoining houses, work in adjoining factories, at the same trade, and receive similar wages. Each takes out a thousand dollar life insurance policy, the contracts being identical and issued by the same insurer, except that Jones's premium is less than that

of Brown. What defence has the insurer before an insurance commissioner on charge of discrimination? None, that I can see. The fact that Jones is covered by a group policy, the premiums for which are paid by his employer, should not give Jones any advantage in rates for additional insurance over Brown.

It may be objected, of course, that the example stated is extreme, and would not occur in practice. Probably this is true, but anti-discrimination laws are hard to beat. Better to adopt practices and methods which cannot be criticized by even critical supervising officials than to court interference.

The other point to which Mr. Morris refers under Selection is that of insuring or re-insuring associations. As you are aware, fraternal benefit societies were originally opposed to group insurance on the ground that life insurance companies would insure the members of such societies, or re-insure the societies themselves, or certain of their lodges. This the companies very wisely do not do. The present agitation of the fraternalists is, however, more far-reaching. It has for its object the enactment of laws preventing life insurance companies from writing group insurance. I do not believe that this attitude is right, nor the position assumed tenable, nor do I believe that the objects sought can be obtained. At any rate, insurance companies should adhere strictly to the limits of the definition which I have already given, or to some other definition which they may mutually agree upon, and not branch out into a field of the enterprise which will antagonize other classes of insurers.

Premium Rates.

Under the above heading, the author gives a full and complete description of this important phase of group life insurance underwriting. I cannot, of course, add anything of importance, except possibly the following taken from my recent paper on "Life Insurance in Groups, 1912-1917," which will be of interest to you as bearing on the question of non-participating rates:

"In 1912, rates for group insurance, such as there were, were of necessity based upon the American Experience Table. In writing this class of insurance a low rate of expense exists. It soon became evident that rates for many of the younger ages, in the case of the less hazardous lives, considerably below the net premiums, according to the American Experience Table, could safely be charged. In other words, the American Table did not appear to be a satisfactory basis upon which to predicate premiums. The basic table adopted for comparative purposes by the Medico-Actuarial Committee of the Actuarial Society of America and the Medical Directors Association in their recent investigation, and based upon the later experience of life insurance companies, appeared to be satisfactory. This basis has accordingly been adopted by some of

the companies. I give below various rates at selected ages, which have been used by at least one insurance company in writing its group insurance. The rates numbered from 1 to 5 inclusive are used for different groups presenting different degrees of occupational hazards. For sake of comparison I give also the net one year term rate according to the American Table and $3\frac{1}{2}$ per cent. interest. Across the columns I have drawn a line. All the rates above the line you will see are lower than the American net premium, whereas those below the line are higher.

Ages.	Amer. $3\frac{1}{2}$ %.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
25	\$ 7.79	\$ 6.01	\$ 6.26	\$ 6.76	\$ 7.51	\$ 8.51
35	8.65	6.41	6.66	7.16	7.91	8.91
45	10.79	9.17	9.42	9.92	10.67	11.67
46	11.17	9.75	10.00	10.50	11.25	12.25
47	11.60	10.38	10.63	11.13	11.88	12.88
48	12.08	11.07	11.32	11.82	12.57	13.57
49	12.67	11.87	12.12	12.62	13.37	14.37
50	13.31	12.76	13.01	13.51	14.26	15.26
51	14.05	13.81	14.06	14.56	15.31	16.31
52	14.87	14.97	15.22	15.72	16.47	17.47
53	15.78	16.20	16.45	16.95	17.70	18.70
54	16.80	17.48	17.73	18.23	18.98	19.98
55	17.94	18.87	19.12	19.62	20.37	21.37
65	38.77	45.88	46.13	46.63	47.38	48.38

“In the proposed rulings of one insurance commissioner, and I understand there are others of the same mind, a rate for group insurance lower than the net premium according to the prevailing standard is not to be permitted. This attitude I think is unfortunate. Any deficiencies in the premiums charged can be and should be taken care of in the reserve maintained. I will refer to this more fully later on. I firmly believe that the rates now in use are adequate. In any case, I am opposed to any legislation or rulings concerning them until it can be shown that they are inadequate. The present indications are that such a proof is not forthcoming. As long as the insureds are protected by adequate reserves, I believe that the companies should be allowed to continue to use their present rates.”

As to the participating rates, I am afraid that I am too firm a believer in non-participating group insurance to discuss this question without prejudice. The participating rate contemplates only a one-rate schedule. Premiums are higher than the net premiums, and if experience warrants, the cost may be below the net premium in the final adjustment of dividends. This adjustment of dividends, of course, should be so made as to reflect the varying degrees of the hazards of the different employments insured and the different manufacturing processes in specific groups.

While I am discussing a phase of *life* insurance, I appreciate the force of the analogy between the underwriting of group insurance and certain casualty insurance lines. My feeling has always been that the rate on a group of employees as originally applied should reflect as far as possible the hazards covered as in the case of liability or workmen's compensation risks. I am aware that so long as life insurance companies write group insurance on the non-participating basis, and at the same time guarantee the rates in the contract for a series of years, they depart somewhat from the casualty features for this class of insurance inasmuch as rates on liability and workmen's compensation risks can usually be adjusted annually so as to reflect any change in the hazard insured.

There are two points referred to in the paper by Mr. Morris which should be emphasized. They both have to do with the casualty aspect of the subject. One is the question of service to the employer, and through him to the employee. While it is true that life insurance companies are to-day giving more service to their insured than formerly, nevertheless, insurance companies writing liability and workmen's compensation insurance have for a longer period than in the case of life companies found it advisable to give service. I have looked into the service offered by one life insurance company in connection with its group life insurance writings, and was surprised at what has already been accomplished by it, and the possibilities which the future offers in this respect.

The second point to be particularly emphasized is the translation of the rate charged into terms of the wage, or as Mr. Morris puts it, "The premium (once determined) is a function of the wage." All companies recognize this principle. The employer knows the amount of his pay-roll. What will the group insurance contemplated cost in terms of that pay-roll? Once that cost has been determined for the employer of a large progressive establishment in pay-roll units, the cost does not vary materially from year to year. I do not believe, however, that the time will come very soon when group life insurance rates will be calculated directly in pay-roll units.

Discussion of Certain Legal Features.

Under the above caption, the author discusses the very important subjects of the selection of a proper mortality table and the proper valuation of group insurance. Very little special legislation has been passed by the various states relating to group insurance. Such as there is appears in a summary at the end of this discussion for future reference.

Mr. Morris refers at length to the special deficiency reserve required by the laws of at least two states and the rulings of the insurance commissioners of other states, and says: "that a peculiar situation has come about whereby the insurance companies have

been obliged to put up deficiency reserves, although complying strictly with the valuation laws of the state."

I do not know whether or not this statement refers to the requirements of the insurance commissioner of the state of Connecticut. Assuming that it does, I do not quite agree with Mr. Morris from the standpoint of the legal requirements of our laws and rulings. The valuation law sets forth a standard. The law presupposes that the rates charged for insurances to be valued under this law are at least equal to the net premiums according to the legal standard. If such gross premiums are below the standard then the usual reserve on the legal standard is insufficient. I use the term "insufficient" in its legal sense, and not actuarially. The law in Connecticut does not deal with the adequacy of the rate, but rather sets forth the standard of valuation and an insurance company which charges premiums which are less than the net premiums according to the legal standard of valuation does not comply with the valuation laws of the state unless it also maintains an additional deficiency reserve equal to the present value of an annuity equivalent to the annual insufficiency of the rate charged.

Once this point is clearly established, I think there is something further to be said on this subject. In group insurance, it is the *group* that is the unit, not the individual employee covered by the group policy. In other words, we must divorce the idea of individual insurance from our minds, and deal with the group. That is what the employer thinks of; the insurer too, and also the underwriter, although due weight must be given to the individuals who compose the group. Why not follow the same idea in calculating the deficiency reserve? If the company is charged with a deficiency reserve why should not credit be allowed for such premiums as are above the adopted standard as an offset to the deficiency reserve? In investigating this problem, we have taken the position in valuing the group policies written by the Connecticut life insurance companies at rates below the American net that inasmuch as group insurance is still in the experimental stage, it is much safer to adhere to our rule. Theoretically, credit for excess premiums could be allowed but from the practical standpoint, I think it unwise at this time and during the period of development and experimentation to consider such a credit in the reserve calculations. I believe that the extra reserve as now required is larger than safety demands, but it is much better to be on the safe side. The companies have met the situation and are setting aside the extra reserve. This reserve at the end of 1916 was somewhat more than \$300,000 and present indications are that the corresponding reserve at the end of 1917 will exceed \$1,000,000.

If a group policy is but one policy why should we not, in calculating the extra reserve, determine first the net American premium for the entire group in the same way as a company determines the gross premium for the group, by combining the various

rates for all ages? This is but an extension of the previous problem. It seems to me that after a year or two more of group insurance, assuming that its development continues along present lines, it may be advisable even under our existing law to consider the blanket policy as a single contract, and for purposes of calculating the reserve ascertain the aggregate net premium corresponding to the aggregate gross annual premium charged in the case of each group. A comparison of these two premiums would immediately show whether the total gross premium was below or above the total net premium. If below then the difference could be treated as the deficiency and the extra reserve calculated in accordance with some average age method.

On page 168, Mr. Morris says: "The fundamental assumption upon which a deficiency reserve is required involves the question of sufficiency of rate." This appears as a part of the author's discussion of certain legal features. While I quite agree with him actuarially, and am willing to emphasize this point, nevertheless, from the legal aspect of the question, I cannot agree that the assumption upon which a deficiency reserve is required involves the question of the sufficiency of the rate. The fundamental assumption, it seems to me, is a legal assumption, the law of the state, or the ruling of the insurance commissioner, and not an actuarial assumption, as apparently set forth in this connection. Mr. Morris points out very clearly and accurately the absurdities into which we are led by requiring deficiency reserves for group insurance issued at rates below the net legal minimum standard. I agree thoroughly with him on purely actuarial grounds.

I also agree with Mr. Morris when he emphasizes the necessity of a proper mortality table as a legal basis for reserve valuation. I cannot refrain, however, in closing this discussion, from saying what I said to the National Convention of Insurance Commissioners in St. Paul last August, namely: "As to the need for legislation, I have tried to show throughout this discussion my attitude. I believe group insurance is established; that it is being written along proper safe lines and that it is meeting a legitimate demand. Do not limit or hamper the development of group insurance by legislation or by rulings if you can reasonably avoid doing so. Let it develop along natural lines. I am fully aware that you may not all agree with me." You all know that the insurance commissioners did not agree with me unanimously, but rather appointed a committee to investigate the subject.

Summary of Laws Relating to Group Insurance.
Arizona.

Any life insurance company may give special rates to members of organizations or to employees in groups of not less than one hundred. Section 3449, Civil Code of 1913.

Florida.

Nothing in this section shall be so construed as . . . to prohibit any life insurance company doing business in this state from issuing policies of life or endowment insurance with or without annuities at rates less than the usual rates of premiums for such policies insuring employees of any employer who through their secretary or employer take out insurance in groups of not less than fifty persons and pay their premiums through such secretary or employer." P. 110-111, Session Laws 1915.

Idaho.

Any life insurance company may issue life or endowment insurance at less than usual rates to groups in organizations, not less than fifty, for insurance taken out through secretary or employer. Chapter 97, Laws of 1913.

Iowa.

Under Section 1783-b, Supplemental Supplement Code 1915, Commissioner has ruled that "a policy covering group life insurance could not be approved, unless there be attached to the same a copy of the application, which shall embrace a satisfactory medical examination." Insurance Commissioner's letter, May 11, 1916.

Maine.

Nothing in this section shall be so construed as . . . to prohibit any life insurance company doing business in this state from issuing policies of life or endowment insurance with or without annuities at rates less than the usual rates of premiums for such policies insuring members of organizations or employees of any employer who through their secretary or employer may take out insurance in an aggregate of not less than fifty members and pay their premiums through such secretary or employer. Chapter 84, Laws of 1913.

Massachusetts.

Section 71. No life insurance company organized under the laws of or doing business in this commonwealth shall enter into any contract of insurance upon lives within this commonwealth without having previously made or caused to be made a prescribed medical examination of the insured by a registered medical practitioner; except that an inspection by a competent person of a group of employees whose lives are to be insured and their environment may be substituted for such medical examination in cases where the insurance is granted under a single policy issued to a given person, firm or corporation, covering simultaneously a group of not less than one hundred lives all in the employ of such person, firm or corporation.

Minnesota.

Any company may issue industrial policies of life or endowment insurance with special rates to members of lodges or employees of one employer for insurance taken out through secretary or employer, not less than fifty in number. Section 450, Pamphlet 1915.

Nebraska.

No life insurance company shall make or permit any distinction or discrimination . . . except that any life insurance company doing business in this state may issue policies of life or endowment insurance with or without annuities on the industrial plan with special rates of premiums (but without discrimination) less than the usual rates of premiums for such policies when issued to members of labor organizations, societies or similar organizations, or employees of one employer, who through their secretary or employer may take out insurance in an aggregate of not less than one hundred members and pay their premiums through such secretary or employer. Provided, however, that nothing herein contained in this section shall be construed to permit the entry into any contract of life insurance upon groups taken from any fraternal beneficiary society doing business in this state. P. 85, Insurance Pamphlet 1913.

New Hampshire.

“Any life insurance company doing business in state may issue life or endowment insurance at less than usual rates to groups in organizations, not less than fifty, for insurance taken out through secretary or employer.” Chapter 127, Laws of 1913.

New Jersey.

No life insurance company doing business in this state shall make or permit any distinction or discrimination . . . except that any life insurance company doing business in this state may issue policies of life or endowment insurance with or without annuities on the industrial plan, with special rates of premiums less than the usual rates of premiums for such policies to members of labor organizations, lodges, beneficial societies or similar organizations, or employees of one employer, who through their secretary or employer may take out insurance in an aggregate of not less than one hundred members, and pay their premiums through such secretary or employer. P. 84, Insurance Pamphlet 1916.

New York.

Section 96 (as amended—1916, 1917).

Limitation of New Business.

. . . provided, that in determining the amount of new business issued, policies of reinsurance, group insurance granted on the same plan within each group, under a contract with a given person, firm or corporation, covering groups of not less than one hundred lives all in the employ of such person, firm or corporation, industrial policies issued upon the weekly premium plan, policies known as intermediate policies issued by corporations transacting the business of industrial insurance, and policies which by reason of residence, occupation, or personal or family history or impaired health, call for the payment of higher premiums than those charged for standard risks, and all premiums on such policies and the expenses in connection with such policies, shall be excluded. . . .

Texas.

Policy may be issued on groups without medical examination of individuals and may be continued on individuals after ceasing to be members of group without violating the Anti-Discrimination Laws. Opinion of Attorney General dated June 30, 1915.

West Virginia.

Section 15. (Amended 1913.) Nothing in this section shall be so construed . . . to prohibit any life insurance company doing business in this state from issuing policies of life or endowment insurance with or without annuities at rates less than the usual rates of premiums for such policies, insuring members of organizations or employees of any employer who through their secretary or employer may take out insurance in an aggregate of not less than fifty members and pay their premiums through such secretary or employer.

MR. EDMUND E. CAMMACK:

The members of the Society are indebted to Mr. Morris for bringing to their attention a comparatively new development in the field of insurance. The importance of the subject will be recognized from a survey of the growth of group insurance since its inception five years ago. In the following table estimates of the amounts of business in force and the number of lives insured at the end of each of the preceding five years and at the end of June of this year are given.

In Force.	Number of Employees.	Amount of Insurance.
Dec. 31, 1912	11,450	\$ 13,083,000
“ “ 1913	30,125	28,235,000
“ “ 1914	52,625	50,605,000
“ “ 1915	105,000	83,920,000
“ “ 1916	202,000	155,300,000
June 30, 1917	325,000	250,000,000

This table is taken from a paper read by Mr. H. Pierson Hammond at a meeting of the National Convention of Insurance Commissioners held at St. Paul, Minn., last August. There are probably to-day, counting the families of those insured, over a million people directly interested in group insurance.

There is a close analogy between compensation insurance and group insurance. Compensation insurance provides indemnity to a workman in the event of disability arising from occupational accident and to his dependents in the event of occupational accidental death. Group insurance provides indemnity in the event of disability or death in active employment from any cause. With the continued centralization of industrial activities in large plants employing large bodies of workers, the personal relations that used to exist between employer and employees have to a great extent vanished. Nevertheless, the employer is coming to recognize that obligations to his employees beyond the payment of wages have not ceased. Group life insurance removes from the employer any further moral obligation to provide on the death of an employee for his dependents. Moreover, it is probable that the cost of group insurance is more than offset by the benefits resulting from increased stability of labor. Insurance increasing with term of service is undoubtedly an inducement to an employee not to change from one position to another unless there are substantial reasons for doing so in the shape of higher pay or shorter hours.

Mr. Morris's description of the usual terms and conditions of a group contract, together with his discussion of the basis of premium rates will be useful to any company contemplating embarking upon this class of business. It is to be inferred from what he states that if premiums are to be paid otherwise than annually, that is, semi-annually, quarterly or monthly, the policy contract should provide for deduction from the claim of the unpaid premium installments for the current policy year. What the employer wants is insurance by a fixed schedule on each life without deduction and, in my opinion, the policy should provide for payment of claims in full. Semi-annual, quarterly and monthly premiums should be true semi-annual, quarterly and monthly premiums and should provide for payment of the full sum insured without any deduction whatever.

Mr. Morris states that frequently a request is received that the employees be allowed to purchase additional insurance equal to the amount of insurance furnished by the employer. A provision in the policy allowing such optional additional insurance would seem to me to be unsound. I do not believe that the danger is eliminated by the requirement of a medical examination, because the persons taking out the additional insurance cannot be bound to continue it during employment but can and probably will in years to come, when they find their premiums mounting up, exercise selection against the company. In my opinion, insurance on

the one-year-renewable-term plan is not suitable for the industrial classes, where the premium is paid by the individual. I believe that such insurance can only lead to dissatisfaction in the end and that it should be discouraged.

Several companies writing group insurance upon the non-participating plan use rates based upon the Medico-Actuarial Mortality Table with three and one half per cent. interest, with a loading of forty cents per \$1000 of insurance and seventeen per cent. of the gross premium. An extra charge is made by addition of a constant at all ages for industrial groups not considered first class risks. It is usual to apply the same rate to all persons in a group even though it may involve several classes of occupation with clearly varying hazards. The aim of the underwriter is to determine a rate which though admittedly inadequate for the more hazardous classes of occupation shall be sufficient when applied to the whole group. In this way the complications attendant to charging varying rates for different classes of occupation in one group as is done in compensation insurance are obviated. In my opinion, refinement in classification should be avoided.

Mr. Morris has suggested that possibly group insurance might be handled in a way similar to that in which the casualty companies transact compensation business. The idea is that premiums could be based upon payroll so as to eliminate the perpetual census record of employees that the companies now keep as a basis of cost. If legal enactment were obtained to enable companies to write business in this way, I doubt whether there would be any resulting advantages.

The basis of insurance for a group policy is usually either annual wages, term of service or flat amount. It is true that when the insurance is based upon annual wages the rate could be approximately computed as in compensation insurance by an audit of the payroll after a census of the employees had been taken. The determination of an equitable rate would necessitate this census, which, however, would not have to be repeated for a considerable term of years. Some modification of the method would have to be adopted when the basis of insurance was other than annual wages. It is my opinion that no economy would be effected in this change. I believe that the cost of audits and periodic censuses would out-balance the cost of keeping a perpetual census of employees. This latter is now done by the employer advising the insuring company immediately he engages or discharges an employee.

Group contracts differ from compensation policies in one respect that should be emphasized. They are non-cancellable and written usually at basic rates guaranteed against increase for terms of years, so far as I know, from five to twenty. The clause in the group policy which allows the employer to continue the insurance upon the life of an employee after his employment has ceased, whether it extends this privilege only to cases in which termination

of employment has resulted from sickness or not, is likely to be such an important factor in the ultimate cost of insuring the group that I think especial attention should be directed to it. When issuing a group policy it is usual to insure only the lives of employees working on full time. Naturally, these lives constitute at the outset a select body. After the lapse of a short time, however, it will probably be found that the employer is carrying insurance upon a good number of men whom he has taken off his payroll, because they have had to stop work temporarily owing to sickness. The body of lives will no longer be a select one. In the first few months of the policy it is probable that the employer will not fully appreciate the privileges of his contract and he will terminate the insurance on a good many employees who have left him on account of ill health but the cause of whose leaving he did not know. After a little experience the employer will take steps to find out the reasons why employees leave him so that he may keep insurance in force on those who have stopped work on account of ill health. I have come to this conclusion from the actual experience of the company with which I am connected. This company has, in fact, paid claims on insurances that have been terminated upon receiving assurance from the employer that employment ceased solely from sickness and that request for cancellation was made under a misapprehension. Furthermore, the experience of the Aetna Life Insurance Co. in its group department shows that the ratio of actual to expected deaths by the Medico-Actuarial Mortality Table increases from the calendar year in which business is issued to the next calendar year nearly fifty per cent. From the experience of several companies the Medico-Actuarial Mortality Table appears to show a decided weakness around age fifty. It is probable, however, that this weakness is largely accounted for by misstatements of age. A workman over fifty years of age is very liable, in seeking employment, to understate his age from the fear that knowledge of his actual age may count against him in securing a position. Evidence of this is shown by the fact that understatements of age at the older ages frequently appear in the settlement of death claims. The only way that a company can protect itself is by charging rates high enough at these ages to cover misstatements. It is not practicable to reduce the sum insured to the amount that the actual premium paid would have purchased at the correct age, because the employer wishes insurance for stated amounts and requires payments of claims in full regardless of technicalities.

Most of the exposure in group business has been in a time of remarkable business activity, accompanied by extraordinary expansion of industrial plants. The question arises as to whether the mortality to be experienced will be affected by periods of depression when the turn-over of labor is greatly reduced.

Mr. Morris states that the mortality experience under group policies has up to now been surprisingly low, but I question whether

there is sufficient evidence to warrant the opinion that it will compare favorably with that under medically examined lives applying for individual policies even when only cases are considered in which the whole of the premium is paid by the employer. While it is apparent that rates computed by the American Experience Table of Mortality with a nominal uniform loading for expenses are entirely unjustifiable, such rates being excessive at the younger ages and dangerously low at the older ages, I am of the opinion that early and immature experience should be used only as a guide for the future and, as a basis of premium rates for long term contracts, with considerable caution.

MR. WILLIAM J. GRAHAM:

Mr. Morris has ably sketched "Group Insurance and Its Possible Development" in his comprehensive paper. Viewed from a life insurance company's point alone, group life insurance is a biggish topic. In its immediate objective of insuring the pay envelope, it goes deeply into problems of the industrial world and ramifies into fields of sociology and economics. When one attaches to this subject, as Mr. Morris has done, a sketch of the possible development of group insurance, the topic grows to such proportion that the lengthy paper of Mr. Morris becomes in itself a bare synopsis. Mr. Morris recognized this when he restricts himself more particularly to the subject of "Group Insurance and Its Possible Development" from an underwriter's viewpoint. It would be a work of supererogation to go through Mr. Morris's entire paper to comment categorically upon the different topics which he has listed. Each subtopic might be much enlarged, but Mr. Morris has wisely held to first principles. Before making a few comments on the broader phases of group insurance and its purposes and possibilities, I will restrict myself to comment on those relatively few places in Mr. Morris's paper, where I think a word of supplement or a divergent opinion is in order.

First, as to the historic reference. Broadly viewed, all life insurance is group insurance, since it is patently impossible to apply insurance principles to an individual except as that individual is made a part of a group. Among the first policies issued by the New England Mutual Life Insurance Company, which was the first American life insurance company to obtain a life insurance charter, was a group insurance contract. This contract was issued on the lives of 700 coolies under one policy issued to indemnify the shipper transporting these coolies from China to Panama in event of the death of the coolies. The policy was taken out for \$15 on each coolie, but the amount was afterward changed to fourteen and seven-twelfths dollars each in order to include twenty additional coolies without increasing the total amount of risk. The Manhattan Life Insurance Company,

which at that time was just commencing business, carried a similar risk on these coolies. This unique contract recited that the policy would continue in force until twenty-four hours after the ship *Sea-witch*, which was transporting the coolies, had successfully completed the journey from China to its destination in the harbor in Panama. To the inquirer concerned with the niceties of classification this risk might appear to be quite as much so some other form of insurance as life insurance, which serves to accentuate the experimental trend and uncertain scope of the business in its earlier day.

The Equitable Life Assurance Society issued, in February, 1905, a policy covering the lives of the employees of the United Cigar Stores Company on the one-year-renewable-term plan, requiring, however, a form of medical examination for this insurance. During the latter part of 1911 two group insurance policies were issued without medical examination on the yearly-renewable-term plan. The Montgomery Ward & Company group policy was issued July 1, 1912. Unquestionably, the inquiry of Montgomery Ward & Company and in particular the brilliant and indefatigable work of the attorney of that company, George R. Durgan, upon plans for employees' health, accident, life and pension benefits, over a period of some two years prior to the actual issuance of the Montgomery Ward & Company contract, had much to do with stimulating and formulating of the group idea.

The only issue that I would seriously raise with Mr. Morris is with reference to his statement on the subject of premium standards. Life insurance differs radically from casualty insurance, inasmuch as the individual age is a determinant of the premium. The reasons for this in individual insurance are obvious, inasmuch as the age measures the increasing hazards to life. Group life insurance is but the application collectively of a form of individual life insurance sanctioned by the various life insurance statutes. The American Experience Mortality Table has been adopted as the statutory standard in most of the states of the Union. In the aggregate it overstates the aggregate mortality of the American life insurance companies by about 30 per cent. of the tabular rate. This overstatement is not uniform at the various ages, being widely divergent, in fact, between the early ages, the middle ages and the older ages. But in the aggregate, for the companies reporting to the state of Connecticut, it produces a mortality ratio of about 70 per cent. of actual deaths to the full number of deaths to be expected from the table. Group insurance is too new and experimental as yet to reach positive conclusions with respect to the mortality. Yet I believe that, in the aggregate, group insurance mortality, to date, will be found to approximate the ratio of actual to expected loss experienced on the regular business.

It would appear, therefore, that the question of adopting a standard of mortality that would more faithfully represent the actual

mortality than does the American Experience Table of Mortality is not a problem limited to group insurance but is more properly to be viewed with relationship to the whole life insurance business. Advocacy of such new table is not new, and has for some years been made the cause of study and investigation by both the Insurance Commissioners and the Actuarial Society with the result that at this time the Actuarial Society has in preparation a new mortality table. Contributions of data from various leading companies represented in the membership of the Actuarial Society of America covering the experience of these companies (on policies with anniversaries from 1900 to 1915) are now in work, under the direction of a special committee, to produce a new table more faithful to actual experience than is the American Experience Table. So far, therefore, as aggregate experience is concerned group insurance has not uncovered any new faults in the American Experience Table.

Again it seems to me that any variation of group insurance from the mortality standard between the different ages is of less importance than the same variation in individual insurance. Mr. Morris points out that the mortality rate in group insurance at the younger ages in much under the American Experience Table and more closely approximates the Medico-Actuarial Table. A variation of this kind, compensated for by a relatively higher mortality at the older ages, leavens itself in the group, whereas it may become a matter of injustice in individual insurance. The lower mortality on the young is compensated by the higher mortality on the older lives, when totaled together and paid for, as is usual, in the group insurance by the employer in one sum. In individual insurance, however, a failure of the mortality to approximately express the rate at any age period may work injustice to the individual premium payer.

The question of lower mortality standard does not necessarily mean the question of lower premium rate. Mr. Morris refers to this when he states that "in using the M.-A. table, however, as a basis for mortality rates it is necessary in building up the premium to provide for ample loading not only for expenses but also for profits or other contingencies." The question of lower rates to the patron and even lower legal reserves is not necessarily involved in question of lower mortality table following more faithfully the experience curve. Naturally, the mutual plan of higher premiums, adjusted later by premium refunds based on experience, has advantages in smoothing out inequalities in mortality tables not present in non-participating rates. But even here it is possible—and indeed would be but following the precedent fixed by large non-participating companies in the field of industrial insurance—for the non-participating company to return more or less gratuitously any unneeded premium excess after experience has established the fact and the amount of any such excess to the patron.

I am not at this time debating the question as to the need or advisability of adopting for group insurance a table which will more

accurately represent group mortality than does the American Experience Table, but I would point out that it has not been shown that the American Experience Table is any more faulty with reference to group insurance than it is with reference to faithfully reproducing the mortality on individual insurance. Why therefore, abandon it for group?

And here should we not give thought to the departure we would thus attempt in our net premium system or at least in the way we have had of following the statutory net premium as a minimum gross premium. Old-line life insurance has grown strong and prospered in America by means of the net premium system and the net premium valuation. Under this system, we set up a standard of mortality and interest planned to serve as an irreducible minimum for fixing our premium valuations, and thus legally presuppose a gross premium of not less than the statutory net premium. We have changed the standards from time to time by statutory means; and it seems to me that we should go slow in introducing any lower standard of premium without statutory permission. If the American Experience Mortality Table, now commonly used as a standard in the various states, is not right for fixing premium rates either for group insurance or other insurances, let us have a new standard, but let it come fully sponsored by law.

Group insurance is transacted under the laws that govern legal reserve life insurance, and for such reason, no statutory permission has been required in the different states to do group insurance, although a few states have adopted amendments to existing laws to facilitate and promote the issuance of group insurance. If, under such circumstances, it is permissible to use the Medico-Actuarial table, which is lower than the state standard of mortality, it is permissible to use any other table. And here we produce the anomaly of old-line life insurance getting away from the general principle of a minimum premium implied by the net premium of the legally established table just when fraternal bodies, after disastrous experiences brought on by lack of a statutory minimum net premium, are called upon by new laws to have such an irreducible net premium in the National Fraternal Congress Table of Mortality.

It is to be noted that since Mr. Morris wrote his paper, the insurance commissioners of the various states have adopted the following resolution:

Resolved, that a committee representing the convention and composed of six to be selected by the President be requested to make an investigation and to report to the convention such standards for conducting the business of group life insurance as in their judgment are necessary for its prudent operation and that the Convention invite the Actuarial Society of America to select six actuaries representing the Life companies to co-operate with this committee

in the investigation, and report to the end that results may be reached which will inspire confidence and general acceptance."

Pursuant to this resolution, a committee of six insurance commissioners has been appointed. A committee of six members of the Actuarial Society of America has also been appointed to confer with these insurance commissioners, as requested. This will probably serve to bring up the subject as to new laws or rulings to be adopted governing group insurance. The appointment of this committee followed the criticisms of certain insurance commissioners as to the departures in group insurance underwriting which they did not consider to be warranted as sound underwriting, but upon which the laws of the state were not sufficiently specific.

These points are well illustrated in a tentative set of rulings issued by Insurance Commissioner Cleary of Wisconsin but now held in abeyance pending the action of the Insurance Commissioners' Committee. These rules are as follows:

"Policies of Group Insurance may be issued in this state subject, however, to the following restrictions:

"1. Benefits under a group policy shall be payable to a beneficiary designated by the employee.

"2. Each group policy shall cover not less than one hundred (100) lives when medical examination is waived.

"3. Lives covered by the policy must be in the employ of a single employer. Selection within the group will not be permitted.

"4. No group policy shall be issued for the purpose of promoting the sale or use of any commodity, or as an inducement to individuals to patronize or deal with any business enterprise or institution.

"5. The group policy shall provide for the issuance of an individual policy to an employee who is for any cause eliminated from the group. This policy shall be issued without medical examination, with a premium rate based upon the attained age of the assured; provided application therefor is made within thirty days after notice from the insurance company that such employee has been eliminated from the group policy, with a statement that he has the right to an individual policy without medical examination. Such individual policy shall, at the option of the individual, be one of the ordinary forms of insurance issued by the company.

"6. The premium charged shall be equal to the net premium for the kind of insurance provided, computed on the American Experience Table of Mortality with interest not exceeding three and one-half per centum.

"7. This ruling, except as to the premium and the medical examination, shall also apply to group accident insurance policies."

Without debating the merits of these specific rulings and the limitations set forth in them, it would appear that all regulations and restrictions necessary or desirable for group insurance could be achieved by a system of rulings of this kind, supported, when

necessary, by statutory amendment, and that no particular code for group insurance, as a separate department of life underwriting, need be adopted. The attempt to clarify group insurance by legislative action has, in the one state in which such attempt was made, caused group insurance to be attacked by advocates of fraternal assessment insurance. These organizations wrongfully assumed that group insurance was meant as a menace to their associations and the objections urged against it were specious and untrue. Nonetheless, carried out as a pure political propaganda, they add to the difficulties of getting intelligent legislative action on the subject.

Mr. H. Pierson Hammond, actuary of the Insurance Department of the State of Connecticut, in an able paper on the subject of group insurance delivered before the Insurance Commissioners' Convention, illustrates the growth and development of group insurance in the following table:

In Force.	Number of Employees.	Amount of Insurance.
Dec. 31, 1912	11,450	\$13,083,000
Dec. 31, 1913	30,125	28,235,000
Dec. 31, 1914	52,625	50,605,000
Dec. 31, 1915	105,000	83,920,000
Dec. 31, 1916	202,000	155,300,000
June 30, 1917	325,000	250,000,000

These figures are highly suggestive when taken in connection with Mr. Morris's statement that at the present time it is doubtful whether over a thousand group contracts have been written in the United States out of the hundreds of thousands of employers who might be interested.

We are learning as a nation that it pays to take care of the human unit—to conserve this unit in life, limb, efficiency and freedom from worry. Our problem, as a democracy, is to achieve this without interfering unduly or unnecessarily in any respect with the individualistic principles upon which our political life is planned.

Group insurance points a way for making life insurance as universal as the pay check.

Every life having an earning capacity creates need for life insurance. Life insurance as individually issued failed, and must fail, to reach all because of its methods of individual selection, entailing as it does rejections for medical, occupational and moral hazards, its establishment of age limits, and, more than all, the method of propaganda by which the business depends upon individual agency solicitation. Group life insurance averages the weak with the strong and insures all, making the sole criterion of acceptability "active service," or being regularly on the payroll of the employer. The employer pays the premium and the consideration is better service from the employee. That this consideration

is real and substantial to the employer is well attested. The employee, therefore, pays for his insurance in coin of better industrial relationship with the employer; and the employer is paid in full. This is a sound basis, consonant with American ideals. It points the way for a further expansion of industrial activities to assist the employee along other directions, such as pensioning, disability benefits and institutional care of health and physical comforts. And it may be restated that all these benefits are part of the Montgomery Ward & Company plan, referred to by Mr. Morris, though only the life insurance has been worked out to the point of reinsuring with an established insurance company.

While, as Mr. Morris pointed out, something of these other benefits might be achieved by use of group policies on other than the term plan, I do not believe that the expansion of group life insurance along such lines will materially assist in these other directions. Group insurance is on the yearly-renewable-term plan because the yearly-term plan is practically an unvarying premium plan when applied to insuring all employees of a going concern. Of course, the premiums on each life vary yearly with the increasing age. But in the aggregate, the age distribution will, with the changes occurring in the personnel, remain on the whole about the same. Therefore, the yearly-renewable-term-plan premium represents to the employer a premium which may vary in either direction of increase or decrease, but within such narrow limits, under ordinary circumstances, that the premium as a whole is practically unvarying. This is pure death benefit at minimum cost. It covers the one hazard of indemnity to the beneficiary for loss of life arising from death through any cause, inclusive of long illness while in the service of the employer. If it is desired to add to the death benefit a provision against old age, I am inclined to think that the logical way to do this is in disassociation with the group life policy.

Pension plans, pension policies, annuities, pension funds—all represent practical ways in which the old age question could be treated as one entirely apart from the death benefit. A logical combination of insurance and old-age provision covering the needs of workers is made by combining group insurance as term insurance over the working period, with some system of service annuities to begin at fixed superannuation age or previous disability. This means insuring the pay check during the term of its receipt and treating the old-age problem in a separate subdivision or as a separate item in the larger category of means to relieve financial distress to the employee.

Group insurance on the term plan, when improved by addition of service pensions, intelligently covers the purpose to be served; to wit, life insurance protection on the term insurance plan while at work, to all the workers, and superannuation annuities at the retiring age for the relatively few who persist in the employment

until they reach the retiring age. This subject of superannuation pensions I will not attempt to treat here other than to point out the fact that there would be an enormous loss to the employer who attempted to cover the same by means of long-term endowment insurance under the conditions of high labor turnover which obtain now in industry.

We now have workmen's compensation insurance, doing a splendid work, which would have been considered socialistic and revolutionary twenty-five years ago. Compensation insurance is a matter of legal justice, while group life insurance is a gratuity, yet, like group insurance, it pays, because it means juster relationship between employer and employee; and I would question whether a substantial minority could be found now among the responsible employers of the country to favor abolishing compensation insurance, even if assured relief from the claims of injured workmen and heirs of the killed workmen. Supplementing compensation insurance, group health and accident insurance, covering other than working hours and classes of diseases not reached by compensation, is, I prophesy, a plan of future development, already presaged by a few such groups now in force. The underwriting difficulties here are much greater than in the adoption and application of group life insurance. Under group health and accident insurance it is necessary to achieve the benefits without haggling with the employees and yet without permitting the employees to malingering. The adjustment of such claims, when handled by the insuring company, presents difficulties on the one hand through friction in too-critical settlements, and, on the other hand, through leniency which would create dishonest claims and consequently promote loss of time and loss of efficiency to militate against other benefits of the insurance. Nonetheless, there is a real field for removing distress along this line. The success of group life insurance indicates the likelihood of this field being adequately investigated and adequately covered. Here, however, chiefly because of the difficulties incident to claim adjustments, the employer will have more reason for considering handling such benefits himself or through a mutual benefit organization than would exist in the case of group life insurance.

Mr. Morris has pointed out reasons which move the employer to insure the group life risk rather than attempt to carry it himself. At that, I believe Mr. Morris has omitted one of the strongest business reasons for an employer's insuring the risk, which is, that by so doing he can place in the hands of each employee an insurance certificate which gives his beneficiary a direct claim upon a responsible life insurance company for the amount of the insurance. While the employer might be abundantly able to carry out any such contract, the practical situation is that the employer is giving this certificate to the living employee, written in his name and that of his beneficiary, is doing him an immediate service. The life

insurance company is, therefore, in position to co-operate with the employer to the extent of visibly benefiting each man in the establishment to the tangible possession of an insurance policy; whereas, under the other system, the benefits are more likely to be considered as restricted to the particular beneficiaries of the relatively few who die.

In conclusion, would state that we are all indebted to Mr. Morris for his painstaking analysis of the underwriting phases of group insurance. Behind this paper of Mr. Morris go years of experience, research, and, as he states with reference to the companies doing this business, "a great deal of time spent on problems that pertain to this subject, time very poorly spent if premium returns were considered." But I know Mr. Morris has not considered his time in this matter. He has given cheerfully, and it would be my particular suggestion to the fertile minds in this Society, dealing as they do with insurance in many forms, that problems presented in the course of our daily work may well be viewed entirely apart from the premium return and with reference to opportunities for service. I feel strongly that the insurance men of this country, and more particularly the actuaries, and, I might add, still more particularly the casualty actuaries, have before them enormous opportunities for devising ways and means of relieving distress through insurance principles in the various forms in which it is possible to relieve such distress from the individual and distribute it among the group. The future is going to know less and less of the wide class divergence which we know today, and is going to bring more and more into our national life the better care of all classes of people. The well-to-do can care for themselves. But the suffering which now comes to the poorer classes through the absence of insurance of the various kinds which we can fancy, through the absence of better medical care, of medicines, of adequate nursing, of hospital service, good air, hygiene, sanitation, decent living places, yea, and playing places, are things which we must correct. And in that correction, along individualistic lines, lies the perpetuation of American standards of individual liberty and democratic government consistent with the imperative necessity of removing in the name of liberty unlimited liberty to the poor, the weak, the thoughtless, to suffer and endure.

MR. RICHARD BRODIN:

The subject has been so well covered in this paper and every phase of the same so thoroughly discussed by the author, that after going through the paper several times, I do not find anything of value to add, in my discussion of the same. There are, however, one or two points which I should like to take up, one of which is the question of plan.

The author discusses only the one-year renewable-term plan, and the ordinary life plan, eliminating the ordinary life plan on account of its higher cost, and its requirement of individual contracts; when he considers only these two plans, there is, of course, everything in favor of the one-year renewable-term contract.

I think that the author should have given us his opinion of the contract on the five- or ten-year renewable-term plan. The premiums on these latter plans are only a very little higher than on the former, and a contract of this kind gives the insurer more stability and continuance in his group-insurance business, the premiums being slightly higher at the beginning of the period than on the one-year term plan, and remaining the same for the respective five- or ten-year period. Compared with the premiums on the one-year term contract, they will gradually be smaller during the last years of the period, for the same number of employees.

The employer will also know exactly what he must pay during the period covered by the contract, and when the contract is renewed for another term, the readjustment of the premiums based on the five-year increased age, will cause the employer to engage younger help as much as possible.

A group-insurance contract on the five- or ten-year term plan, also works in the interest of the company, because if the policy should lapse during the early years of the period, on account of non-payment of premium, the company will be somewhat reimbursed for its initial expense, by the reserve.

Premium Rates.—The rate-making problem solves itself, in finding a basis on which to calculate a basic net premium covering a non-hazardous mortality. For this purpose, the M.-A. Table is not to be recommended, as the same is based on the experience of insured lives with medical examination.

It appears to me that the United States Life Tables of 1910, issued by the Bureau of the Census, could give us a table of mortality as close to the actual expected as can be desired. This table is a population table showing a slightly higher mortality than the M.-A. Table, which in my opinion is quite right, on account of the selection resulting from the medical examination which can not be altogether eliminated by taking away the mortality during the first five years of insurance.

The table I refer to is "Life Table for White Males in Cities of the Original Registration States." The same is ungraduated, and to be useful for our purpose needs to undergo a smoothing-out process. The reasons for my recommending this table are self-evident.

After the basic net premium is found it is a matter of underwriting ability to determine the differentials to be applied in order to obtain gross premiums of the "Group" to be insured. I believe that a study of workmen compensation rating is very valuable in this regard.

The foregoing discussion is not adding much of value to the paper and must be viewed in the spirit of "doing my bit" as a member of the Society.

MR. EDWARD B. MORRIS:

(AUTHOR'S REVIEW OF DISCUSSIONS.)

The author's principal intention in presenting this paper was the introduction of a subject of considerable importance on which there was comparatively little literature, although the subject involved perhaps one of the most radical advances in life insurance development in recent years. Although the paper as presented was a long one as compared with the usual contributions to the Society, it really only touched upon its outline. The possible development of insurance by groups really deserves months of continuous study. Life insurance when applied to the insuring of individuals through the issuance of individual contracts has settled itself into a known science, by which I mean that there are no radical changes involved from year to year. Its reconstruction means the redevelopment of older practices. The corresponding situation as involved in the insuring of lives by groups is today a very different proposition owing to the newness of the business. While the issuance of group insurance on employees by means of the one-year renewable term policy is in itself a simple matter, in theory at least it involves especially in its underwriting feature fertile fields of investigation which are hardly suggested in individual life insurance. As Mr. Graham has pointed out, since the paper was presented the insurance commissioners have become interested in group insurance and interesting discussions of the subject are now under way under their guidance. While the endeavors of this committee will undoubtedly be to conserve rather than to construct, the whole subject is today in a period of transformation.

The result has been that the comments upon the author's original paper have been almost as voluminous as the paper itself. Those who have discussed the paper have been members personally interested in the development of this business. The Society is therefore to be congratulated upon the character of the discussion.

Perhaps the principal point which has been mentioned has been regarding the proper basis for group rates. This is particularly of interest as the subject has been discussed from the two points of view—that is, from the participating and from the non-participating—and a perusal of these pages will show some of the fundamental differences that exist. I shall make no endeavor to here discuss this matter further than to state that the subject is necessarily an important one and is undoubtedly heading towards a satisfactory conclusion. The proper basis of rates is, of course, dependent upon the experience of the companies writing the business. As has

already been stated from various sources, this experience is far from complete inasmuch as the business is comparatively new. The companies writing the business have gained many important facts but these pertain more to the tendency of the final result than to the final result itself. It is my conclusion that it is safer to let the companies work out their own salvation, correcting any mistakes which have been made, in an endeavor to put the business on a stable basis. In the author's opinion it would be wrong to hamper the development of the business, for instance, by destructive legislation. The companies which are involved in the business are practically all of sufficient size to stand some shock but inasmuch as the development of the business necessarily tends towards a leveling of ideas (for it must not be forgotten that no company is desirous of writing the business at a loss either to stockholders or to policyholders) the general progress is favorable. Underwriting principles will be gradually established; contract conditions must gradually become uniform and I venture to state that the cost of group insurance in the various companies spread over a satisfactory period will closely approximate itself regardless of company or regardless of the various methods upon which the companies proceed.

As has been ably pointed out, there is a vast chance for development in the service pension benefits, that is, in the actual return to the employee for long service in the way of an annuity. There has not been considerable accomplished yet along these lines and consequently a tremendous field is open.

In conclusion, I wish to thank the members of the Society for their attention to this subject and especially those members who have so ably contributed towards its discussion.

REVISION OF WORKMEN'S COMPENSATION RATES (JANUARY-MARCH, 1917)—HARWOOD E. RYAN.

VOL. III, PAGE 175.

WRITTEN DISCUSSION.

MR. RALPH H. BLANCHARD:

The divergence between financial exigency and scientific thought is well illustrated in the chief controversy of the recent rate revision over the use of graduated reduction factors, law differentials and expense loadings. The immediate cause for revision was the necessity for an advance in rates to provide adequate income for the carriers. The application of a flat percentage increase to all rates would have been the simplest means of accomplishing this end. But the demand for justice to individual classifications precluded any such aggregate method of procedure. So law differentials were revised, the experience of individual classifications and groups of classifications was considered, and a rough graduation of expense loading by states was retained. While the procedure and the results are a real improvement over those of the 1915 conference, they are still marked by the desire for action rather than accuracy and by an easy tolerance of assumptions and approximations which produce sufficient income.

This criticism is not intended to imply that thoroughgoing scientific accuracy was possible. The necessity for immediate advance in rates was properly controlling. The graduation of reduction factors and of law differentials presented problems of statistical research which required considerable time for solution. Nor was there complete agreement on the basis of such graduation among its advocates.

The recognition of the principle by the actuarial committee and the adoption of a resolution calling for further actuarial and statistical study are forward steps. They are evidence of a growing purpose to begin preparation for further rate revision sufficiently in advance to preclude the familiar explanation that changes proposed in the interest of actuarially sound rate-making were admirable but that practical necessity and a lack of time prevented their adoption.

Less defensible, it would seem, was the refusal to adopt a graduated expense loading. The flat loading used in each state is assumed to be offset in some degree by the flat differential, but this is only an assumption, while the principle of the graduated expense

loading is an easily demonstrable truth and the preparation of a formula for its application not a difficult task.

The argument advanced in favor of the experience rating loading of one per cent., while probably not intended seriously by its author, is symptomatic of a tendency induced by the necessity of "explaining" rates. The experience rating plan was itself based on assumptions and the contention that its results show experience rated risks to be of a higher grade than risks not so rated involves a further assumption that the earlier assumptions were correct. It would be productive of great good if the mental energy expended in "justifying" rates could be turned toward improving them on the basis of a frank recognition of defects, often warranted by lack of information and the exigencies of a practical situation. Certain of the factors now used which rest largely on assumptions are not for that reason invalidated. But every effort should be made to replace the assumptions with facts.

Probably the 1917 Conference did its best work in accomplishing a careful readjustment of basic pure premiums in the light of greatly increased and more accurate statistical information. The new pure premiums, especially those for classifications with a wide exposure, represent less of judgment and more of experience than ever before.

The recognition of new factors and of new principles, embodying a tendency to consider detailed, as well as broad means and results, points the way for future development. The greatest possible aid to such development should be found in the application of statistical tests and in the comparison of statistical results under various methods. Such studies, yielding more and more accurate information, should gradually furnish sound bases for the elimination, adoption and readjustment of methods. Perfect justice may be unattainable, but it can be much more closely approached.

MR. JOHN L. TRAIN:

Mr. Ryan in his paper recites in a clear and concise manner the action taken by the augmented Standing Committee on Workmen's Compensation Rates in revising workmen's compensation rates. As the manufacturers are more and more, especially as compensation rates are being increased, taking an interest in the methods used in making such rates, I hope that this paper can be sent generally to manufacturers' associations throughout the United States.

The work of this rating conference was a great improvement over that of the conference held in the winter of 1915. Results of that conference were not acceptable to many of the states and were not adopted, fortunately, by New York State. The objections made to the rates of the conference of 1915 were that no factors were included for three important elements, namely underestimates of outstanding losses, increasing cost, and effect of schedule rating.

At that time, it seemed to be clearly realized that some factor should be included in the multiplier for each of these items, but these factors were seemingly excluded because the amount to be included in the multiplier could not be definitely arrived at. Had these multipliers been included as they should have been, the insurance companies would not have experienced the losses sustained in writing this class of business during 1916. In this revision of rates, therefore, a long step forward has been taken by the committee.

As Mr. Ryan points out in his paper, additional problems will have to be considered when workmen's compensation rates are again revised; two in particular; the question of graduated law differentials and expense loading. The various tests made by the Rating Conference clearly indicated that there should be a graduated law differential, but I am satisfied that such graduated law differential should not be made on the basis of the premium rate alone. The manual shows many classifications wherein premium rates are the same, where in one case the premium is based almost entirely upon death losses and in another case upon other classes of injuries. Any defect in the plan adopted by the last conference in not adopting any system of graduated law differentials is, of course, offset to a very considerable extent by the fact that there should also be considered the question of a graduated expense loading.

The basic pure premiums established for the various classifications this year were, of course, much more accurate than those previously established on account of the increased experience available to the Committee. However, in 1915 there was for a number of classifications, a large volume of experience and the additional experience on those classifications did not materially change the pure premium. In fact, the Committee this year in a great number of such classifications re-established the pure premium arrived at in 1915. Year by year, with additional experience, the number of classifications which have been rated on the basis of classifications with analogous hazards, will be reduced and the problem of establishing basic pure premiums will, to a great extent, solve itself. The great problems in the field of establishing proper workmen's compensation rates for the future seem to rest more upon what factors of loading should be included in the rates, and the weight of each factor.

MR. EDMUND S. COGSWELL:

Mr. Ryan has furnished us with a valuable description of the work of the Augmented Standing Committee on Workmen's Compensation Insurance Rates, which met in New York City for several weeks during the first three months of 1917 for the purpose of making a general rate revision. He commences his paper by

calling attention to the necessity of increased rates as shown by the returns to the New York Insurance Department for the policies issued in New York during the years 1914 and 1915. As of September 30, 1916, the indicated loss ratio for 1914 issues was only 51.29 per cent., but for 1915 issues the loss ratio had increased to 68.16 per cent. It is interesting to compare these loss ratios with the combined results of Massachusetts Schedules W. Schedule W, 1915, showed for the stock companies a loss ratio of 84.12 per cent., and Schedule W, 1916, showed a loss ratio of 81.57 per cent. in spite of the fact that on May 1, 1916, increased rates went into effect. The mutual companies, some of which charged higher rates than those in effect for the stock companies, showed a loss ratio of 63.37 per cent. according to the 1915 Schedule W, and 68.77 per cent. according to the 1916 Schedule W.

The benefits under the Massachusetts Workmen's Compensation Act were considerably increased on October 1, 1914, but no increase in rates took effect until May 1, 1916. Schedule Z, 1915, showed for the stock companies a loss ratio of 73.65 per cent., and for the mutuals 58.17 per cent. for the period from October 1, 1914 to expiration, for policies outstanding on October 1, 1914. Schedule Z, 1916, which was filed in April, 1917, a few weeks after the adjournment of the Rate Conference, showed a loss ratio for the stock companies of 78.77 per cent., and for the mutuals 60.72 per cent. for the period from October 1, 1914 to expiration. One cause of the lower loss ratio of the mutual companies is that some of them charge premiums higher than those of the stock companies. Schedule Z, 1916, included the experience from October 1, 1914 to expiration on policies outstanding on October 1, 1914, and the full experience of the issues of 1915. The increased rates of May 1, 1916 applied to policies outstanding on that date which were written on and after July 1, 1915, otherwise the loss ratios would have been even higher. As the expense ratio of the average stock company according to Schedule W was 40.13 per cent. for 1915 and 38.83 per cent. for 1916, it will be seen that the companies were losing money in Massachusetts as well as in New York.

After mentioning the reasons for the calling of the 1917 Rate Conference, Mr. Ryan explains in his paper the work performed by the various committees. The principal committee made a careful revision of the pure premiums of the classifications in the Manual. While numerous changes were made, the pure premium level was increased only one-half of 1 per cent. Before the Conference had finally completed its work, tests made by Mr. G. F. Michelbacher showed that the new pure premiums reproduced the Massachusetts losses with remarkable fidelity, the excess of the actual losses over the projected losses being only $\frac{8}{100}$ of 1 per cent. After all the pure premiums had been determined and the Conference had adjourned, the Workmen's Compensation Bureau of the Massachusetts Insurance Department made a final test and found that the projected

losses almost equalled the actual losses, the difference being only $\frac{1}{16}$ of 1 per cent.

The marked difference for Group 1 of the table below is due to the large payroll for the classification "Clerical Office Employees," and the marked difference for Group 5 is due to the classification "Drivers." For this latter classification the Conference adopted a pure premium of 61 cents, but as the Massachusetts experience showed a much higher pure premium, the Massachusetts Bureau adopted an exception and made the pure premium for this state 74 cents.

MASSACHUSETTS—PART I—SCHEDULE Z, 1915.

Group No.	Basic Pure Prem.	Payroll.	Ratio of Actual to Projected Losses.
1	.03 to .10	\$211,562,654	.725
2	.11 to .20	256,725,059	.985
3	.21 to .34	281,665,591	.990
4	.35 to .47	162,065,147	.993
5	.49 to .67	89,993,060	1.066
6	.71 to 1.23	88,389,907	1.034
7	1.29 to 1.78	23,399,561	1.035
8	1.86 to 7.09	35,834,832	.998
Total		\$1,149,635,811	1.006

The Massachusetts Insurance Department also made a test of the Part II experience as shown by Schedule Z, 1915, and the ratio of actual to adjusted losses was 1.391, or about the same as appeared at the Conference.

MASSACHUSETTS—PART II—SCHEDULE Z, 1915.

Group No.	Basic Pure Prem.	Payroll.	Ratio of Actual to Projected Losses.
1	.03 to .10	\$72,827,888	.928
2	.11 to .20	72,965,640	1.523
3	.21 to .34	69,556,026	1.405
4	.35 to .47	55,949,719	1.297
5	.49 to .67	30,150,860	1.584
6	.71 to 1.23	28,732,091	1.405
7	1.29 to 1.78	8,261,509	1.108
8	1.86 to 7.09	9,177,498	1.477
Total		\$347,621,231	1.391

The large difference in Group 5 is due to the classification "Drivers." The Massachusetts Bureau has adopted a higher pure premium than that adopted by the Conference. The results of the tests made before the Conference adjourned are shown in Mr. Ryan's paper (see *Proceedings*, Volume III, page 186).

The Manual Committee of the Massachusetts Rating and Inspection Bureau made a study of the Massachusetts experience shown in Schedule Z, 1916, which was filed in April, 1917, and as a result made about 140 exceptions to the pure premiums as shown in the Basic Manual. At least one-fourth of these exceptions are of minor importance so far as Massachusetts is concerned, and were made merely for the sake of consistency, for when the committee changed the pure premium for an important classification it also changed the pure premiums for classifications in the group which were of similar hazard even though some of these classifications showed little or no payroll in Massachusetts. Exceptions were made mainly for classifications where the Massachusetts Schedule Z showed a payroll of over \$500,000 for either Part I or Part II. Tests have been made by the Insurance Department for the classifications where a payroll exposure of over \$500,000 on either part of Schedule Z, 1916, has been reported: first, to see how closely the basic pure premiums multiplied by the payrolls would reproduce the losses, and secondly to see how nearly the pure premiums adopted by the Massachusetts Bureau would accomplish the same result. It will be noted that the basic pure premiums failed to reproduce the losses as shown on Schedule Z, 1916, by 1.4 per cent., whereas the Massachusetts pure premiums almost exactly reproduce the losses. As the statement has sometimes been made that exceptions are almost invariably downward, it is interesting to note that in Massachusetts the opposite occurred, and the result of the exceptions made for the important classifications is to increase slightly the premium income.

There happen to be a number of important classifications for which the Massachusetts Bureau adopted pure premiums ranging from .49 to .67, where the Part II experience showed much higher pure premiums than did Part I, the ratio exceeding 2.00 for some of the classifications. Combining the experience for both parts on

COMPARISON OF PROJECTED AND ACTUAL LOSSES USING BASIC PURE PREMIUMS.

Part I—Massachusetts Schedule Z—1916.

Group No.	Pure Prem.	Payroll.	Proj. Losses.	Actual Losses.	Ratio of Actual to Proj. Losses.
1	.03 to .10	\$ 191,748,117	\$ 82,957	\$ 55,102	.664
2	.11 to .20	244,019,800	355,440	348,955	.982
3	.21 to .34	263,485,939	704,356	702,216	.997
4	.35 to .47	143,608,489	607,911	602,210	.991
5	.49 to .67	86,153,203	500,303	504,012	1.007
6	.71 to 1.23	70,077,399	605,013	623,050	1.030
7	1.29 to 1.78	19,316,692	304,416	348,021	1.143
8	1.86 to 7.42	23,238,502	477,603	504,317	1.056
		\$1,041,648,141	\$3,637,999	\$3,687,883	1.014

Part II—Massachusetts Schedule Z—1916.

Group No.	Pure Prem.	Payroll.	Proj. Losses.	Actual Losses.	Ratio of Actual to Proj. Losses.
1	.03 to .10	\$ 174,724,670	\$ 75,801	\$ 93,109	1.228
2	.11 to .20	177,351,708	260,629	378,995	1.454
3	.21 to .34	214,595,444	574,721	818,975	1.425
4	.35 to .47	134,045,053	559,428	828,201	1.481
5	.49 to .67	75,202,756	433,070	720,347	1.663
6	.71 to 1.23	55,556,390	478,275	670,625	1.402
7	1.29 to 1.78	15,901,983	248,018	325,226	1.311
8	1.86 to 7.42	15,622,906	324,019	552,195	1.704
		\$ 863,000,910	\$2,953,961	\$4,387,673	1.485

COMPARISON OF PROJECTED AND ACTUAL LOSSES USING PURE PREMIUMS ADOPTED BY MASSACHUSETTS RATING AND INSPECTION BUREAU.

Part I—Massachusetts Schedule Z—1916.

Group No.	Pure Prem.	Payroll.	Proj. Losses.	Actual Losses.	Ratio of Actual to Proj. Losses.
1	.03 to .10	\$ 188,706,975	\$ 79,916	\$ 50,553	.633
2	.11 to .20	251,608,012	359,873	361,435	1.004
3	.21 to .34	276,562,675	742,138	755,115	1.017
4	.35 to .47	106,412,303	451,602	459,274	1.017
5	.49 to .67	83,273,228	468,649	426,205	.909
6	.71 to 1.23	89,151,665	735,711	737,652	1.003
7	1.29 to 1.78	20,217,364	300,572	336,668	1.120
8	1.86 to 7.42	25,715,919	549,262	560,981	1.021
		\$1,041,648,141	\$3,687,723	\$3,687,883	1.000

Part II—Massachusetts Schedule Z—1916.

Group No.	Pure Prem.	Payroll.	Proj. Losses.	Actual Losses.	Ratio of Actual to Proj. Losses
1	.03 to .10	\$ 171,781,211	\$ 72,858	\$ 77,215	1.060
2	.11 to .20	184,016,012	265,799	404,731	1.523
3	.21 to .34	222,384,566	595,133	857,328	1.441
4	.35 to .47	102,796,519	435,553	582,752	1.338
5	.49 to .67	77,119,114	428,666	681,132	1.589
6	.71 to 1.23	71,196,953	584,199	852,711	1.460
7	1.29 to 1.78	16,307,222	241,167	340,252	1.411
8	1.86 to 7.42	17,399,313	373,588	591,552	1.583
		\$ 863,000,910	\$2,996,963	\$4,387,673	1.464

The Total Payroll of Schedule Z, 1916, Part I, is less than shown in Schedule Z, 1915, because one company, which went into the hands of a receiver, did not file its Schedule Z at the time the schedules of the other companies were filed.

In some tables the payrolls of certain classifications have been omitted, either because the classifications have been eliminated, or special rates

adopted for individual risks, as for example under the classification "Chemical Mfg. N.O.C." For these reasons the payroll for Part I is \$57,159,813 less than appears in Table T of the latest report of the Massachusetts Insurance Department. The amount of payroll not included in the tests involving Part II experience is \$35,213,965.

such a classification on the 1.45 differential basis which was the basis used by the Massachusetts Manual Committee in its work, produced a pure premium lying between that shown for Part I and that shown for Part II.

This in large measure accounts for the Group 5 experience on the basis of the Massachusetts pure premiums being out of line for both Parts I and II as shown by the tables.

The tables prove that the law differential factor (which includes some increasing cost) of 1.45 which was inserted in the present Massachusetts multiplier is not too high.

A test has also been made by the Massachusetts Department of the experience of the classifications for Part II of the Massachusetts Schedule Z, 1916, on which less than \$500,000 payroll was reported. These tests based upon a payroll exposure of \$68,752,266 show ratio of Actual to Projected Losses of 1.513 if the basic pure premiums are used, and 1.458 if the Massachusetts pure premiums are used.

The work of the Actuarial Subcommittee of the Standing Committee in determining the various factors for the state multipliers, which Mr. Ryan describes in some detail in his paper, was accepted in most of the states. California, Pennsylvania, Wisconsin and Massachusetts however adopted multipliers somewhat less than would have been worked out if all the Committee's factors had been used without modification. The factor of $1\frac{1}{2}$ per cent. loading for profit was not approved in Massachusetts, and in some other states, because the Insurance Commissioners believed that the interest on the invested assets was a sufficient source of profit for the companies.

As Massachusetts had adopted a modified form of the Industrial Compensation Rating Schedule which it was believed would produce a balanced rating schedule the factor for the effect of schedule rating was not adopted by the Massachusetts Rating and Inspection Bureau, and as Pennsylvania was not using this schedule, this factor was not applicable there. The pure premiums of classifications in the basic manual subject to schedule rating were loaded 9 per cent. for the effect of schedule rating, and the symbols printed were those after the loading had been applied. Thus Classification No. 3632, "Machine Shops—no foundry," for which the Committee had selected a pure premium of 47 cents and which appeared in the former manual with a rate symbol "CB," now carries the symbol "CD," the symbol of a 51 cent pure premium. This made it difficult to use the new basic manual in Massachusetts. An at-

tempt was made to use the basic manual by printing a list of classifications subject to schedule rating and which pure premiums contained the 9 per cent. loading, but the resulting manual was cumbersome and with the several exception sheets required by the action of the Massachusetts Bureau in adopting so many changes, it was necessary to look at seven or eight pages in some instances to determine correctly the rate for a classification. The Massachusetts Bureau decided to print a separate manual and Pennsylvania has done the same. If the Basic Manual is to be used in the future everywhere throughout the country, if the factor for the effect of schedule rating is continued, steps should be taken by the next conference to avoid this difficulty.

In his paper Mr. Ryan mentions the discussion which took place concerning the adoption of a graded expense ratio and states that this is one of the two questions where a thorough and early investigation is exceedingly desired. In making the Pennsylvania rates the Pennsylvania Rating and Inspection Bureau gave much consideration to this subject, and a graded expense loading was adopted.

Mr. Ryan calls attention to the various problems of compensation rate making which are not yet solved—among them the questions of a variable law differential and a graded expense ratio, and recommends the establishment of a permanent organization as was suggested at the Conference. Recently the Standing Committee on Workmen's Compensation Rates has been reorganized under the name of the National Reference Committee, the present membership of which comprises the following:

Maryland Casualty Company,
Royal Indemnity Company,
The Travelers Insurance Company,
New York State Insurance Fund,
Liberty Mutual Insurance Company,
Utica Mutual Compensation Insurance Corp.,
Massachusetts Insurance Department—*Chairman.*

This Committee has recently created an Actuarial Subcommittee, the members of which are Messrs. Greene, Chairman, Flynn, Moore, Mowbray, and Woodward. This Subcommittee is to take up the questions which were not settled at the last Conference, and before another Conference is called, attempt to lay out a method of procedure along scientific lines. The first work of this Committee is to recommend a suitable and justifiable basis for the determination of minimum premiums, as the action of the Augmented Standing Committee in increasing the minimums for many classifications has caused protests in New Jersey, New York, Massachusetts, and other states.

A history of the 1917 Conference is being prepared by the National Workmen's Compensation Service Bureau as Secretary of the Augmented Standing Committee, and those who are interested in the history of compensation rates will await the publication of

this document with interest. Meanwhile Mr. Ryan has performed a real service by giving us a full outline of what transpired.

MR. HARWOOD E. RYAN :

(AUTHOR'S REVIEW OF DISCUSSIONS.)

In closing the discussion it may be well to supplement that portion of the paper which has to do with the expense loading. I have had several inquiries with reference to the nature of the specific items which go to make up the expense loading for New York, which is 36 per cent. of the gross rate. As such items have a general application, it seems proper to set forth the provision which has been made for them in the rates. In making reference to the several percentages it should be borne in mind that they relate to the highest level of rates in the United States at the present time, hence those items of expense which are not incurred in direct ratio to the gross premium must, for any lower rate level, be more liberally provided against.

NEW YORK EXPENSE LOADING.

Item.	Per Cent. of Gross Rate.
(a) Acquisition cost	17.5
(b) Administration or home-office expense	5.5
(c) Investigation and settlement of claims	5.5
(d) Inspections and accident prevention	3.5
(e) Taxes, licenses and fees	2.5
(f) Payroll audits	1.5
	<u>36.0</u>

An expression of opinion on the subject of this paper which possibly may be of interest appears in a letter received by the author from a gentleman in Switzerland who is intimately associated with the underwriting of workmen's compensation insurance. The letter is of peculiar interest because it expresses a somewhat different viewpoint from that which has been heard from underwriters in this country. Unfortunately it was received so recently that it has been impossible to obtain permission to publish the name of its author. With this exception the letter is reproduced in full:

"ZURICH, November 26, 1917.

"*My dear Mr. Ryan:* You have been kind enough to send me a copy of the very interesting paper read by you at a meeting of the Casualty Actuarial Society on the subject of Revision of Workmen's Compensation Rates. This has had my best attention and I wish to thank you for your kindness in sending same to me.

"With reference to your remarks concerning the law differentials

—page 179—permit me to mention that it seems highly desirable and of greatest importance that the subject of determination of the proper divisors and multipliers be reconsidered at the earliest possible time. Comparing the rates in force in the various states for risks of the so-called non-hazardous classes it is quite apparent that the very wide discrepancy between the New York rates and those of certain other states is not justified. On risks of these classes accidents of a light nature are in great majority and, the period of disability being usually short, it is evident that the duration of the waiting period prescribed by the different laws is of greatest influence on the total loss cost. In fact, a practical test will show that under certain circumstances the pure premium for risks of this kind may be even higher in Illinois, Massachusetts, Wisconsin, Pennsylvania, etc., than in New York while, on the other hand, the application of the uniform differential produces rates or premiums which are in striking contrast to the actual needs.

“The volume of experience accumulated at this time should be sufficiently broad to serve at least as a guide for the fixation of rates which are better suited to the individual hazard of a given classification or group.”

There is undoubtedly a sincere desire on the part of actuaries and statisticians to reach a more satisfactory set of principles to be followed in combining the experience of several states and in projecting rates from the amalgamated data. It is necessary, however, in order to obtain for such principles a fair trial in the process of rate-making, that they be enunciated sufficiently in advance of a general rate revision so as to lend themselves to practical tests. The outstanding need of casualty insurance as at present conducted is a standardized procedure in the treatment of statistical information which will command the respect of the underwriters who, like ourselves, have been groping toward proper solutions to our rating difficulties and who, noting division of opinion on the part of the actuaries and statisticians, can scarcely be criticized for caution when innovations are proposed.

The members of this Society can do no greater service to workmen's compensation in particular and to casualty insurance in general than by the enunciation of and adherence to correct principles. One of the most encouraging things about the recent conference on rates was a greater tolerance by the underwriter of the statistician and the actuary and of their skilled methods. Indeed, one ventures to hope that the scientific viewpoint with respect to rating questions will, in the end, receive proper recognition.

RATE REGULATION—ALBERT W. WHITNEY.

VOL. III, PAGE 191.

ORAL DISCUSSION.

MR. I. M. RUBINOW: I want to just question possibly the entire accuracy of one statement on page 191 made by Prof. Whitney; perhaps I had better read it: "Where competition is restrained there is in theory the possibility of rates being too high. In practice this is a remote contingency." I don't think that the entire problem of rate regulation is solved when the adequacy of the rates has been protected. I think that on the whole it is true that, taking the business world at large, it shows a great deal more interest in protecting itself against rates that are too high than rates that are too low.

Of course, the argument can be made that competition as such tending toward low rates will prevent the necessity of any regulation of rates, so as to protect the insured against rates that are too high. But I beg to submit that in the present stage of compensation insurance, that competition isn't always effective. Of course, we all know that the whole problem of rate-making has been absorbed by organizations of insurance carriers. There always remains, of course, theoretically what has been called about fifteen years ago by Prof. Clark, "potential competition," the possibility of the organization of new carriers, which may act as a threat and keep the rate down, as it is supposed to act as a threat and keep prices of the manufactured products down. But potential competition takes a long time in working itself out and isn't always effective. Of course, in industry potential competition is limited in time because of the necessity of building plants. It is true that that difficulty doesn't exist in the insurance business—it doesn't take very long to build a casualty insurance company plant. But nevertheless, with modern methods of supervision of stock-floating, necessity of raising money may at various times, when financial conditions are not favorable, find sufficient opposition so that potential competition doesn't realize itself, and meanwhile the rates may remain too high. Moreover, rates may not be too high in general and yet may be too high in individual classifications. And, of course, the opposition of the employer is always against a specific rate being too high, and he doesn't give a continental as to whether the rates of his friends are too high or not: but what he is interested in is specific rates and not the general level of rates.

I don't think that there is as yet, although there may be in the

future, a complete parallel between life insurance rate-making and compensation insurance rate-making; the difference largely being, of course, due to the fact that our science isn't as highly developed, because it is more complex than life insurance is. And for that reason, it may be true that the danger of rates that are too high has been eliminated in life insurance and has not yet been eliminated in compensation insurance.

I want to close with the statement—and to make it absolutely safe, I shall make it foreign—that if you remember, the rates in England for several years were too low; that is, considering the methods of the business, the total rate was too low to meet the total expense, although, of course, it was adequate to meet the net cost and provide for a reasonable expense loading, but after struggling along for several years without having the scientific methods that we have developed in a much shorter time, in this country, they have “jacked up” the rates, as the saying goes; and the first year after the rates were “jacked up,” the insurance companies which, on the whole, previously showed a loss of three to four per cent.—at least an underwriting loss—without taking into consideration the investment profits, have showed the first year after the rates were “jacked up” a profit of twenty per cent. Now, it is possible that after that, competition which is very much more active in the English compensation business than it is in America may have reduced the rates again, but for that year, the rates were undoubtedly excessive, which is an illustration that compensation rates may very readily become too high; and no rate regulation will be complete unless it takes both limits into consideration.

MR. ALBERT H. MOWBRAY: There are one or two other points that I would like to refer to in this paper. The paper is, of course, very short, and it seems to me that Prof. Whitney may have been very discreet in confining his discussion to the question of approval of rates and leaving entirely out of consideration the question of the machinery in use for handling the general problem of making the approved rates effective and the necessity for such machinery.

Beyond merely referring to that, I don't think I will discuss that point further. But on page 192, he refers to the question of control of rates through reserves. He says: “Theoretically there might be a control of compensation rates through reserves and as a matter of history, it is interesting to know that in the first year of compensation in California a bill providing for this kind of control passed the legislature but failed of signature by the governor. In practice, however, a control of the rates themselves is doubtless to be preferred.” I am not familiar with that first California measure. My impression was that that was a percentage of premium reserve basis, which after all, as far as I can see, would not get at any control of the gross rates. But there is another matter which, if it goes on, will, in my judgment, replace, to a large degree, the whole matter of rate regulation, or perhaps I

should not say replace the whole matter of rate regulation but rather create such effective rate regulation through reserves that direct rate regulation may become absolute.

I think it was two years ago Commissioner Hardison recommended to the legislature, after one of the foreign companies had withdrawn from the state, that the companies foreign to Massachusetts be required to deposit in the joint custody of the Insurance Commissioner and the Industrial Accident Board, I believe, funds to secure the payment of deferred compensation. That recommendation was enacted into law.

During the year just past a local company has failed and in the Commissioner's current report he recommends that that regulation be extended to domestic companies. As long as that requirement—of course, that may not become law—but as long as that requirement exists in the state of Massachusetts only, there will probably not be any real rate regulation in it. But it seems inconceivable to me that such a regulation can become thoroughly effective in Massachusetts without being gradually extended to the other states of the United States. When we do have—if we ever do—general legislation throughout the United States requiring the deposit of funds to secure deferred liabilities, we are going to have pretty effective rate regulation, provided there is some reasonable, proper and adequate method of determining what those deferred liabilities are, other than somebody's personal judgment. And it would not be any surprise to me at all to see ultimately through that process the casualty people placed somewhat on the same plane as life insurance.

MR. ALBERT W. WHITNEY:

(AUTHOR'S REVIEW OF DISCUSSIONS.)

Replying to Dr. Rubinow, I do not mean to say that theoretically competition in insurance will always produce reasonable rates; I mean that practically and in general I believe it does. However radical we may be in our theories of social reconstruction, competition must always be largely relied upon for the regulation of business. It appears to me that competition, when restrained, works well enough in insurance, so as not to need to be entirely displaced, at least at this stage of our development, by other machinery which would be bound, under existing conditions, to be very difficult to operate successfully.

Replying to Mr. Mowbray, I must admit that I drew that California bill myself and, if my memory serves me right, the plan was this: A state bureau in which companies were to participate was to make the workmen's compensation rates for the state. The rates, however, were to be mandatory upon the companies only for purposes of calculating reserves. Realizing that this would produce

a very inadequate control both of solvency and rate discrimination, unless the reserves were made expressly applicable to the state, we provided for a deposit of securities in the state to cover the reserves.

We tried to follow as closely as possible the procedure in life insurance. There the problem is particularly simple, for the rates are implicitly defined as soon as the mortality rate and the rate of interest are specified. In the case of compensation, the rates would have to be explicitly given.

It is very likely that the control would not have worked out so satisfactorily as in life insurance. I am sorry, however, that the plan was never given a trial.

In closing I should like to emphasize one point at least that we can apparently all agree upon—that the problem of rate determination is so serious and difficult that all interests ought to unite in its solution, and in that effort this Society should exert an important influence.

THE THEORY OF LAW DIFFERENTIALS—G. F. MICHELbacher.

VOL. III, PAGE 195.

ORAL DISCUSSION.

MR. I. M. RUBINOW: Mr. Chairman, I have no written discussion for the reason that my paper on "The Theory and Practice of Law Differentials," which I presented yesterday, can be taken in the nature of a discussion of the same problem, which I thought was more important than a discussion of an individual paper on the same subject.

There is an advantage in not having a written discussion in that one may refer not only to the original paper, but also to the written discussions that have preceded.

I think that perhaps the essential problem has been stated, in questioning the proof of the assumption that there is a permanent and universal relationship of hazard. That would be true, all other things being equal. If all other things in two states are equal except the law, then that assumption might hold. We are, after all, measuring not the amount of human suffering, but the cost of that human suffering to an insurance carrier.

The second point is that no two things are equal, or need be equal, in two states. If you remember Mr. Scattergood's paper (Synthesis of Rates for Workmen's Compensation, 1916) perhaps one of the classic presentations of the whole subject of compensation rate-making, you remember the very lengthy formula which was caused by the number of different factors that have to be taken into consideration, even in the present stage of rate-making, and yet, all the possible factors, all the various quantities, have not been taken into consideration, even in that formula.

Let's illustrate my thought. The number of accidents in the same industry in two different states will depend upon the age of the industry. Modern plants are presumably safer than older plants. They are different in many ways: the motor power may be different, the location may be different, in two different states; the labor conditions in two cotton mills, one situated in the South and the other in Massachusetts, may be vastly different, with the exclusion of child labor in the North. For in the South, notwithstanding the modern laws, child labor does exist. Then there is the difference in the relation of woman labor, which is a factor of great variability just at present; the difference in racial competition, in educational standards (to mention only a few variants). So that in actual practice, we ought to expect to find what we really do

find—that the physical hazards in the same industry of different states don't need to be always in the same proportion that we would expect. And, of course, there also comes in the question of the difference between an actual differential in certain classifications and the general flat level differential.

Now, if that assumption of correspondence of hazard relations, while theoretically sound, other things being equal, in practice isn't sound and it falls down, then I may be permitted, as one of the original men who have worked out the theory and the practice of law differentials, to say that we have got to reverse the entire process and admit, instead of claiming, as we do, that a law differential is the type, the normal and that exceptions may be provided for—instead of that, admit that the local rates should be based upon local experience and that the law differential methods must also remain a catch-all for such classifications, which evidently cannot be based upon local experience.

Now that, of course, would mean that the very theory underlying your basic manual breaks down. I say it with a good deal of regret, because I had a good deal of faith in the sentiment attached to it; but instead of hoping that we may get nearer to it, we might as well frankly admit that we will get farther and farther away from it.

I should think that perhaps I may make a few remarks in regard to the general discussion of rate-making, because, after all, many of those papers fall in the line and treat of the same subjects. The whole difficulty is that the employer is bound to expect a good deal more light on the rate-making in the future than he has in the past. I think the attitude a few years ago was that rate-making is so mysterious in compensation, that it would be hopeless to expect the individual employers to understand it. And I think the argument frequently was made that the complications of certain methods are more desirable because of their complications.

That thing wouldn't hold with a large and important employer, and our industry, of course, is constantly coming into the hands of large employers. Assuming proper cost accounting in any plant, which means inquiry into every element of cost, whether it be taking place in the plant itself or by payment to an outside agent, you have got to recognize that there is bound to come an inquiry from the employer of every risk. And the local experience very frequently is going to govern over and above a formula that has been sent in from outside the state; unless the employer can be convinced that rate-making has come to such a high state of perfection and is done by people who have absolutely no interest in the matter, he is unwilling to waive his own responsibility.

Now, when I say that, I do not mean to throw any reflections upon the motives of the men who are making the rates at present. It isn't intended as a reflection upon the casualty men, because that

same unconscious influence might, and is being, felt by the actuaries of the mutuals and by the actuaries of the state funds. It doesn't make any difference what the particular business connections are. But evidently rate-making must be done by people who have no business connections, whose business it is to make rates for everybody, and who are not at the same time connected with one particular institution or branch of the insurance business.

Then possibly you might influence the employer to admit that somewhere a body, an absolutely impartial body, exists whose judgment in those matters must be better. I want to bring out the point that I haven't brought out in my paper yet—not only is the continuation of the use of the Massachusetts basic law, the old law as a basis, undesirable and open to criticism from many employers—and to illustrate, one very large employer in the copper industry in the West asked me: "Will you tell me any reason why the copper-mining rates in this state should be based upon the cost in Massachusetts? I know that there are no copper mines in Massachusetts," and I couldn't meet his argument. Of course, you might talk to him about Massachusetts as an abstract, a standard law, but you could never convince any practical employer to see the wisdom of it.

Now, if that was the inevitable method, if we had to have some abstract law upon which to base all our rates, no matter what the particular industry we are dealing with, of course then we could meet the criticism. But, as a matter of fact, I do not personally see any necessity for having one basic law, and I don't think that a system of law differentials requires it, though it has in the past.

With a proper institution for making a very much more profound study of differentials than has been made in the past, with a much more complicated system of law differentials, my idea is that the basic state and basic act for each group of classifications should be the particular state or group of states where that particular classification has the greatest experience.

So if you are dealing—to come back to the copper industry—if you are dealing with copper-mining rates, you have got to take for your basis—Utah or Arizona, and not Massachusetts; and, of course, if you are dealing with cotton goods, you may take Massachusetts as a basis.

All this gets back to the idea that I tried to convey yesterday, that there is an imperative need for the public, an efficient institution, where the entire time of its officers is devoted to the making of rates and law differentials. And the cost of it doesn't need to scare the business, with a hundred million dollars' premium income a year. I could quote individual risks whose insurable interests, you might say, in this particular problem—whose difference between a proper and improper rate for one year, would be able to support the entire rate-making institution for several years. I am thinking of one risk whose premium on a basis prepared by a

formula—Massachusetts basis, with the ordinary loading for expenses—would have amounted to \$250,000, the loading on that particular hazard being over a hundred thousand dollars. They refused to pay it, and they didn't insure and they are running their own insurance department that costs about \$25,000—a difference there of \$75,000, which would more than pay for all the actuarial work that is called for in the law differentials.

AGE, OCCUPATION AND RESIDENCE AS VARIANTS OF THE RATE OF SICKNESS—ALBERT H. MOWBRAY.

VOL. III, PAGE 213.

WRITTEN DISCUSSION.

MR. WALTER I. KING:

If it were not for the war we would, without doubt, find ourselves much further advanced in the throes of socialistic propaganda and thus be dealing more intimately with the question of state insurance, especially compulsory health insurance. It remains to be seen whether the war will increase or decrease the socialistic tendencies. Yet the country in general was so nearly pledged to compulsory health insurance before the war absorbed the most of our attention, it behooves its actuaries and statisticians to inform themselves thoroughly on the subject that as far as they can they may direct the steps of this country in the right direction.

Almost every country, which has had extensive workmen's compensation experience, has found that compulsory health insurance is a logical adjunct of such insurance. The experience of Austria, indicated in the following quotation, has been the general experience:

"While sickness or other temporary disability may be due to causes other than industrial, the policy of making compulsory insurance against sickness a feature of the industrial organization of a country is now regarded in Austria as the only practicable solution of the problem. Although the causes of sickness arise in part from the physical and mental constitution of the individual workman and in part from general living conditions, both causes are strongly influenced by occupation, by influences connected with occupation and in particular by the general standard of life of the individual as fixed by his occupation and the income derived therefrom."* 24th Annual Report of the U. S. Dept. of Commerce and Labor, page 226.

It is not surprising then that we find compulsory health insurance agitated in the United States and the thanks of the Society are due to Mr. Mowbray, who, with his characteristic insight and aggressiveness, has called our attention to this subject and in so doing indicated for consideration some of the points which must

* This is given as a fact of conditions in other countries without any intimation that these same conditions exist in the United States.

necessarily be dealt with in coming to any conclusion relative to the proper rate of morbidity under compulsory health insurance.

Our real knowledge in regard to the incidence of morbidity has advanced very little during the last one hundred and twenty-five years, although we have learned considerable about the rate of morbidity in various orders and organizations. This is without doubt due to the intricate nature of the problem at hand and the many and various influences affecting the rate of sickness. In mortality statistics we deal with the contingency of death—the happening of one event about which there can be no rules and regulations and concerning the happening of which there can be no doubt, while in morbidity statistics we not only have to deal with the happening of an event and its duration, but with many and various rules relative to what constitutes the event itself as well as the time of commencement, the duration and recovery. Furthermore, we are dealing with a contingency, the actual existence of which can be easily faked and, therefore, much fraud perpetrated through malingering and camouflage. It can be seen, therefore, that we are dealing with a very complicated and complex problem, about which we cannot be too careful in drawing conclusions, especially conclusions of comparison.

For these reasons there has been no one, as far as I am aware, who has attempted in any published table to give anything more than the rate of morbidity in the particular organization under study. The incidence of morbidity of any general group of people has not been published. It is, then, of the utmost importance that the various characteristics of the various published tables be thoroughly understood in order that proper conclusions may be drawn from these tables with respect to new problems, as they arise.

The function of morbidity depends upon the occurrence of disability and the period of disability. It follows, therefore, that our term "rate of sickness," as Mr. Mowbray says, "is generally taken to mean the average number of days . . . of sickness per persons under observation for one year." There is, however, a point here which is worthy of notice. In America where health insurance has been taken voluntarily by the insured and the contracts reserve the right of cancellation by the companies, there is no particular inducement for an insured to pay a premium during disability in the event such premium falls due during said period of disability. Statistics for such contracts should be based upon the total number of days of disability following the occurrence of a disease, provided only the disability commenced during the year under observation. Where the insurance is compulsory, however, the premiums are payable annually whether the life is active or disabled and in such an event there will be considered in any one year only such numbers of days of disability as fall within the year under observation and following the occurrence of disability within that

year, together with any continued days of disability from the previous year observed.

Such a distinction makes considerable difference in the rates obtained and should be borne carefully in mind in comparing rates. This goes to show how important it is with health insurance to see that the facts of each group compared contain no fundamental differences that would vitiate any such comparisons.

Mr. Mowbray escapes any such comparisons by drawing conclusions from each individual experience. We must not think, therefore, that the rates are comparable. There is one impression which one might get from the wording of the paragraph at the top of page 215 and that is, we can by using the statistics of the insurance institutions of those countries where such insurance is compulsory obtain the index of morbidity for compulsory insurance in the United States. I do not believe Mr. Mowbray meant to give this impression and I only call attention to it so that it might not be taken as an authoritative statement some time in the future for using these rates as representative rates of morbidity in the United States under compulsory insurance.

Even in those organizations where insurance is compulsory, the rules and regulations of the body and the manner in which they are carried out is a great, if not the greatest, single influence on the rate of morbidity. Take, for instance, the experience of the Leipzig Local Sick Fund with respect to its compulsory and voluntary membership as published in Table 1 of Mr. Mowbray's paper. The rates for ages 15 to 19 under voluntary membership are greater than the rates for ages 65 to 69 under compulsory membership and practically this whole distinction is caused by the rules governing membership and the consequent selection in the one group and not in the other. This variance is much greater even than that indicated by age, occupation or residence and while it is an extreme case, it is indicative of the care which must be exercised in handling such figures.

We have another good illustration of the influence of rules and regulations on morbidity statistics in the increase in the rate shown by the successive published experiences of the Manchester Unity and I can probably do no better than to quote Mr. Watson's paper referred to by Mr. Mowbray: "In drawing attention to such experience I would remind the reader that permanent incapacity is very much a matter of supervision, both medical and administrative, and the self-interest which theoretically might be presumed to dominate the management of such purely mutual institutions as the English Friendly Societies is frequently subordinated, especially in the wealthier of these bodies, to the promoting of sympathy and kindred tolerance with the result that the moral qualities of the individual frequently exercise too large a part in the measurement of the disabled risk." (4th International Congress of Actuaries, Vol. I, page 481.) In explaining this increase in

rates Mr. Watson says such explanation is probably found in a great measure in the growth of the funds of the friendly societies, leading on the one hand to an increase in the habit of leaning on the societies and on the other to an imprudent relaxation of restrictions formerly considered necessary for common protection.

There is no doubt, I think, in the minds of those who have studied the subject that age, occupation and residence all act as variants with respect to the rate of morbidity. Such facts have been brought out by most every experience published, with the possible exception of the experience on commercial health insurance as written in the United States. The first table about which anything is known was one published by Dr. Price in 1789, to be used in connection with the poor laws in England. This was based upon the theory that under age 32, $\frac{1}{8}$ of the Society would be incapacitated through sickness. From age 32 to 42, $\frac{1}{4}$ more than $\frac{1}{8}$ would be so incapacitated. From age 43 to 51, $\frac{1}{2}$ more than $\frac{1}{8}$; from age 52 to 58, $\frac{3}{4}$ more than $\frac{1}{8}$ and from age 58 to 64, $\frac{1}{4}$. It was first believed that the figures for ages under 32 were based on actual experience but this has not been proven and it is quite probable that the whole table was based on the general assumption that as life approaches its close, sickness becomes more frequent in the ratio as life becomes less valuable.

This table was followed in 1823 by tables prepared by Mr. W. Morgan and Mr. Frend on the following assumption:

Ages.	Number Incapacitated.
10 to 25	1 in 46.222
25 to 30	1 in 37.828
30 to 40	1 in 32.00
40 to 50 to 65	1 in 27.66

This table was known as the Northampton Sickness Table. In 1824 the first table drawn from actual experience was published by the Highlands Society in Scotland, which showed that sickness increased gradually with advancing age, the rate of disability being increased nearly $\frac{1}{6}$ part of a week for every five years up to age 40; between ages 40 and 50 more than a week; between ages 50 and 60 nearly two weeks and between 60 and 70 nearly six weeks. Thus it will be seen that what first in England was assumed to be a matter of common sense has proved in subsequent experience to be correct, namely, that with advancing age there occurred a decreasing resistance to withstand disease and a decreased recuperative power to recover from disease.

In Germany the cost of insurance has been figured as a percentage of the workingman's wage and hence the function of age did not enter into their statistics. This, however, was found to be

a mistake and in later years their experiences have been based upon age groups. With this in view the following quotation is of interest: "Throughout the special study of the statistics of sickness based on the experience of the Leipzig Fund special emphasis is placed upon the importance of age grouping. It is pointed out that unless information concerning the age grouping of the total number of persons forming the basis of the statistics is known, serious errors are likely to occur in computing sickness and other rates." And again, "the writers of the report on the Leipzig Fund have, therefore, applied the rule that to obtain trustworthy rates of sickness not only the age grouping of the persons included in the cases of sickness, or days of sickness, must be known, but also the age grouping of the total number included in the occupation or industry."

In using Chart 1, page 218, I think it would be well to point out the fact that it is useful only as showing the increased rate of morbidity with advancing age for each individual class here studied. The actual rate for each society and the steepness of the curve of morbidity are both affected by various causes in each individual society and they, therefore, should not be used as a comparison of the rate of morbidity between the societies.

I do not think Mr. Mowbray would have gone too far had he been more emphatic in regard to the almost uselessness of the figures of the companies writing commercial health insurance in the United States to give any true index of the incidence of morbidity among any class of people in this country. As is pointed out in my paper read before this Society in October, 1915, entitled "Accident and Health Insurance from an Actuarial Viewpoint" (*Proceedings*, Vol. II, p. 49), this experience can represent little more than a rate of sickness among a class of lives which are constantly kept superstandard by the weeding out of the weak lives and those who through impaired vitality would be less able to withstand disease. In other words, these statistics are little more than a measure of what might be called the accidental diseases of life and as such it is a small wonder that they present almost a constant rate for all ages under 50. We have sufficient evidence, however, in the tables used by Mr. Mowbray and other experiences to clearly demonstrate that it is most important to take account of age distribution in considering morbidity statistics.

Occupation and residence are also important factors, but whether they are as important as age is a question. We are all familiar with the fact that certain occupations, if followed for any length of time, will produce definite diseases. We are also familiar with the fact that the rate of sickness in certain territories has been greatly decreased through improved sanitation, but just what influence this would have upon figures that would be applicable to compulsory health insurance in the United States is a question. It is clearly evident that in considering experiences already published, it is of

utmost importance to ascertain if there was anything about occupations of the groups insured that would materially affect morbidity. On the other hand, under a general compulsory health law, where all occupations would be grouped together, the feature of occupation and residence would bear about the same relationship toward general morbidity as it does in life insurance toward general mortality. That is to say, there are some occupations and some localities where the hazard would be so much greater than the average hazard as to make risks in such occupations or territories substandard when compared with the general morbidity of a heterogeneous group.

This is partly shown in Mr. Mowbray's first conclusion under *Sickness Rates by Occupation*; i. e., "the extent of variation in sickness rates with occupation is much greater when individual occupations are used as a basis of distinction than when the industry in which the worker is employed is the basis." This simply means that there is less variation in morbidity in any occupation from the general average of all occupations, than between the more and less favorable occupations, and except in the few cases of extreme extra hazard, for practical insurance purposes most occupations can be grouped together, thus giving us what Mr. Walter S. Nichols would call "true insurance."

In closing these few remarks, I wish to reiterate Mr. Mowbray's remark that the subject is worthy of study, and express my regret that these strenuous times have kept him from going further. There is a good opportunity, however, for some one who has time to study into the published tables with a view to adjusting them for their various differences as to rules, etc., so they can be compared.

ORAL DISCUSSION.

MR. I. M. RUBINOW: I am almost ashamed of myself, Mr. Chairman, for getting up so often, but I don't think it would be quite fair to myself not to say something when the question of health insurance is being discussed.

I think Mr. Mowbray has done a good service in pointing out the essential variants of age and occupation and locality (rather than residence, although, of course, residence itself might have an effect—plumbing conditions of the residence—but from a broad insurance point of view, it is the locality problem that is of rate-making importance). There is no doubt, even from the amount of limited experience that has already been accumulated, that occupational differences and the industrial differences are very much more important than the age difference, notwithstanding Mr. King's statement. I don't see how any one could read the figures that are available and make the statement that Mr. King has made, that the age differences are of greater importance. I don't think it is quite correct to say—I am afraid that I will have to direct myself

more against what Mr. King has said than against what Mr. Mowbray has said, because on the whole I agree with Mr. Mowbray's presentation of certain data—I don't think that there is any basis for the statement that European experiences are unavailable, because already sufficient experience is accumulated in this country to indicate that our own sick rate will fall somewhere between the sick rates of various European countries.

I don't want to make a guess whether it is going to be nine days or six days or four, because some European countries indicate four days' sickness and others go up as high as nine and ten, but the essential, the important thing in constructing plans for health insurance is to know that it is sufficiently important to be a subject for legislation, and also that it isn't going to be so high that it would make an insurance system impossible. I am making this very trite observation because of the statement that our own sick rate is going to be so very much higher than European experiences have shown. And that for that reason alone, we must discard European experience. It is one of those contradictions that has developed in the discussion of health insurance. In one breath we are ready to say that we are such a healthy race that we don't need it, and in the other that we are such a sick race that we can't run an insurance plan. I might mention a few others; and I am not making any argument for health insurance, because this isn't the subject for discussion, but there must be some logical consistency in statements. For instance, we say on one hand that we are too rich to need health insurance and on the other hand that we are too poor to afford it, and we say that voluntary insurance is just as good; can accomplish everything that compulsory insurance can; and we also say that compulsory insurance has accomplished nothing that is good and everything that is bad.

There is a substantial volume of experience in America. Mr. Mowbray has quoted a good deal of that. I think you will find a good deal of it gathered together from printed sources, and also a good deal of additional first-hand information, in the California Social Insurance Commission's report. My own estimate for California was six days. Dr. Warren's estimate for the country at large was nine: possibly this more correct for the country at large. I was dealing with sunny California—don't forget that. Mr. Mowbray will agree with me that there is no other place as healthy as California. The investigations of the Metropolitan Life Insurance Company seem to approach nearer to Dr. Warren's estimate of nine days, which is, on the whole, in correspondence with the German experience.

There is one point that I think Mr. Mowbray has not emphasized—if he has referred to it, I am not sure—and that's an important actuarial point for all of us, who undoubtedly in a few years will be investigating the subject (I may say parenthetically that there are at present about eight or nine states investigating the subject,

so there is an opportunity for at least eight actuaries to do some work) that no published statistics, with possibly very few exceptions, can undertake to give the actual sick rate. What they do give, when gathered under health insurance laws, is the average number of days compensated for, and you can readily see that that is an entirely different statistical category. Sickness is a very elusive sort of phenomenon. I don't think it is all camouflage, because if it were, our health insurance companies wouldn't be writing any business, because surely they are not insuring against camouflage, but it is a psychological condition.

Very often I get up in the morning and I feel very sick—not too sick to go to the office, but I do not feel well. That sort of thing isn't being compensated for. It is very largely an opinion, a feeling. The essential difference between the general sick rate and the compensated sick rate is that in the latter case it must be an opinion of two people. It is like a note that carries two signatures is always better than a note that has only one signature. A man isn't compensated because he feels that he is too sick to go to work, he is compensated if somebody else agrees with that opinion.

Then another thing. He may not be too sick to go to work, but so sick that he shouldn't go to work; and that is a very important consideration. Very often the man in his anxiety to be a faithful worker may insist that he is not sick enough to stay away, but his physician may insist that he should, and that is the main reason why in the European sickness experience the number of sick cases has been constantly rising, which was in some people's opinion an indication of camouflage. It isn't: it is because the physicians' opinions are becoming more liberal; and a man is compensated not only when he wants to stay at home, but when he should stay at home.

There is another factor, a statistical factor that disturbs the series. Various provisions of the insurance system may limit compensation, either in the beginning or in the end of sickness. We are all, of course, familiar with this phenomenon under compensation, except that in health insurance those limits, in the beginning, are less stringent than our compensation limits are—very seldom over three days, and at the end of the sickness very much stricter than compensation limits are, varying from thirteen to fifty-two weeks. Twenty-six is the standard average.

Now, no figures published in Europe attempt to give the true sick rate; they only give the compensated sick rates within the limits, and that is another factor that must be taken into consideration. I assume from reading Mr. Mowbray's paper that it was not to give the actual statistical data. I believe that his purpose was to give you some illustrations of a problem, and from that point of view the paper must be discussed and the importance of those variants in constructing sick rates and planning for an administrative system of health insurance must be given consideration.

Those two problems are not necessarily tied up. It is assumed that because there are variants that therefore the organization of health insurance must adjust itself to those variants.

Now, a life insurance company insures people of various ages and a health insurance company insures people at various sick rates and charges them various rates if it wants to. The great difficulty, as Mr. Mowbray has pointed out, is not with the variants. It isn't even the fact that the famous actuaries of England have made the same mistake that was made by Mr. George King of the Institute of Actuaries of Great Britain, and assumed that the age variant is more important than the age limit, and then made all kinds of complicated provisions for the age variants and haven't made any provision for the occupational variant, that they nearly ruined a good many of the funds. The greatest difficulty with the British system—a difficulty which doesn't exist in any other system in the world, and we hope will not exist in this country—is that they have written into the law the rate of insurance, uniform for everybody, with the only adjustments to age variants on a basis not of the rates, etc., but of a sliding scale of benefits; which is, I think, the most illogical form of insurance that could be provided.

There is another very important consideration I want to bring up. All those variants refer to the worker. The plans in this country, as far as they have been developed, include the medical aid to the family and medical aid is a very substantial part of the whole cost of health insurance—a very much larger part than is true of compensation. You can readily see what a great statistical difficulty that introduces. The combined amount of sickness due to the family and the cost of its medical care would be varying, according to entirely different principles, between a single man and a married man, and according also to the size of the family; and you would have to combine all those things, or variants, with the variants referring to the worker himself, which Mr. Mowbray analyzed that you had. If it were really true that you had to either legally or morally adjust your rate to the particular hazard of the person, the problem of rate-making would be extremely difficult indeed, and especially difficult because the plans as they stand at present are contemplating the distribution of the cost between employer and the employee and the state. For instance, a tremendous pressure would be created against the married man, the man with a large family.

As a general problem in the philosophy of insurance is it imperative that we do take care of all those variants? It may be imperative that we permit the insurance carrier to take those variants into consideration; and that was done in the American drafts; that is, the American drafts of the bill specifically state that the carriers may, if they wish, adjust their premiums, not to the age, but to the occupational hazards. But is it necessary from an insurance point of view that it should be done? Now, that

might appear to some of you a very heretical question, whether it is necessary to adjust the premium rates to the hazard, but, now, really, is it socially necessary? We may want to do it, and we may not want to do it; and without arguing the comparative advantages of the two plans, I want to say that much, that the prevailing system in Europe is not to carry those fine differences into the rate. If the Leipsig Fund, for instance, with 200,000 employees, some of whom are young men, some of whom are old men, some of whom are single and some of whom have large families (the Germans have large families), if they are quite willing to charge everybody the same percentage of rates, perhaps we might want to do the same thing. We must not forget that, after all, while I am not going to try to make any form of definition of insurance for fear that Mr. Blanchard may read it at the next meeting of the Society, it is a question of mutual protection. Mutual insurance in this country may not be scientific, but it exists; and in so far as it is dangerous, it isn't that they are not making sufficient lines of distinction, it is because the reserve conditions may be unsafe. But if a body of people want to get together for mutual insurance, without calling attention to every specific factor of difference in hazards, they ought to be permitted to do so.

After all, life insurance has been very far from taking all the different variants into consideration; they are only taking one, age. It happens that in life insurance it is an important variant, but there are other important variants, and if I should become a miner tomorrow, my life insurance policy will remain in force, although my hazards of death will increase very much; and yet we are not speaking of life insurance as a most scientific business. So, while I am not going to say what is going to be the form of health insurance in this country, it is very likely to happen that those many variants, no matter how interesting they are, may not be used. There is one safeguard, however, and that is provided in European practice and also provided in American plans, and that is the development of establishment funds. They are very convenient carriers of insurance, as any manager of an establishment fund and any large establishment will tell you. They are convenient for administrative purposes and exactness of the risk. There is no difference of locality, etc., and they also have the tremendous advantage of taking in the same occupational hazards.

MR. ALBERT H. MOWBRAY:

(AUTHOR'S REVIEW OF DISCUSSIONS.)

I have very little to say in closing except that I think I have accomplished what I set out to do when I wrote the paper. Dr. Rubinow has discussed it very much from the standpoint of the bill that was drafted by the American Association of Labor Legislation.

A recess committee of the Massachusetts Legislature presented a certain report for changing workmen's compensation conditions there, and while I won't go into the influences which might have prompted a response, the response of the manufacturers there in the form of a protest was such that the plans were very much upset. The proposition of general health insurance has been broached in the United States by certain people from a particular point of view. The matter is up for public general discussion. That general discussion is bound to revamp and remodel the original proposals.

So far as I have seen, the various people discussing it have been prone to lay to one side any consideration of technical questions involved; have assumed that if it is more in accordance with the American spirit, to have a voluntary system. On broad general lines, without very much definition of how it can be carried out, it can be carried out just as well as a general compulsory system; that a system of organization along trade lines wouldn't interfere with a system of organization along community lines, and that you can organize a sickness institution and sort of throw it into the river and let it swim. The spirit behind the good old I. O. U. W. was as admirable as anything we know of, and that institution during its lifetime did a large amount of good, but it did a large amount of harm, because it didn't take proper consideration of the technical problems that were involved.

It was my hope, in presenting this paper, to draw attention to some of those technical problems; and because it would be impossible to consider all the things Mr. Kopf spoke of, I picked out certain ones which seemed to stand out prominently, in the hope of putting something in the paper which might later be referred to in the discussion of the general plan; not in the thought that the technical problems necessarily overruled considerations of public policy, but that safety required that they be not altogether overlooked in the discussions.

NOTE ON THE FREQUENCY CURVES OF BASIC PURE PREMIUMS—

ARNE FISHER.

VOL. III, PAGE 241.

WRITTEN DISCUSSION.

MR. EDWIN W. KOPF:

In commenting upon Mr. Fisher's approaches to some fundamental problems of higher statistical analysis in workmen's insurance, it is perhaps relevant to suggest that even our more experienced members are not yet prepared to apply the more recently developed analytic methods and criteria in their daily statistical and actuarial work. It will be a more important service to define this broad difficulty than to discuss the details of Mr. Fisher's application of higher statistical analytics to a single rating problem. The observation of W. P. Elderton on the place of modern statistical analytics in insurance science* outlines the difficulty fairly well. He says: "It is difficult to tell how far such methods may prove useful in direct application to actuarial problems, but even if they happen to be of only slight assistance, it seems advisable for actuaries to have some knowledge of the contemporary study of a subject connected with their own work on the theoretical side." This statement was addressed to life insurance actuaries. As far as it pertains to the statistical foundations of life insurance this observation still holds to a very great extent. In its fundamentals, life insurance makes no extended demand upon applied logic and the other elements of statistical philosophy beyond the sound discussion of dichotomous classification of data and the analysis thereof.

Casualty and social insurance, however, demand manifold classification of sense data and of insurance experience. When we deal analytically with the highly complex social facts subject to manifold classification, we are required to employ methods specially suited to our data not to be found in the technical equipment of statisticians who deal only with the two facts, life and death. I believe that before proceeding with a specific rating problem in casualty insurance, Mr. Fisher should first attack the broader question of showing the nature and necessities of the analytic methods in social statistics which must be used in order to intelligently handle data requiring manifold classification. Our members must be gradually led away from the simple, comfortable statistical dis-

*"Frequency Curves and Correlation," p. 7.

cipline of life insurance science and of mortality statistics. Casualty and social insurance should rest upon the broader and more complex basis of descriptive and analytic social statistics and in this regard it must blaze a new trail in the statement of statistical difficulties and solutions. I do not believe Mr. Fisher has made it sufficiently clear to our members, that the complex social phenomena, subject to manifold classification, which are set forth in our ambitious syllabus, have inherent characteristics which demand the application of the higher tests. Data which is to be presented in manifold classification, must be tested for stability, class-homogeneity, frequency distribution, and to other preliminary analysis before we can arrive at any final and valid conclusions.

Many of our members have a false sense of security in dealing with statistical data. They have too much faith in a mystic "law of large numbers" and of statistical consistency and regularity. In the present crude state of descriptive social statistics, the one thing which confronts us is baffling irregularity. We may say with Richmond Mayo-Smith as regards our methods of social statistical analysis: "It must never be forgotten that the best work in statistics remains to be done, not so much in world-wide investigations covering millions of individuals, where all local influences are effaced, as in the more minute investigations of particular conditions, where the specific forces can be detected."

Before we apply the very useful methods of the analytic statisticians, we need a statement of the nature and deficiencies of our descriptive data and a clear outline of the reasons why higher statistical concepts and methods are necessary for drawing conclusions. Only upon the basis of such a statement can we base a number of detailed lines of related inquiry and to understand the place in our technical equipment of the valuable methods such as Mr. Fisher has given us in his articles.

EDITOR'S NOTE.

Mr. G. F. Michelbacher submitted a written discussion of Mr. Fisher's paper, which has been omitted from the record because of Mr. Michelbacher's admission that he made an error in reaching the conclusions which he submitted in his written discussion.

ORAL DISCUSSION.

MR. ALBERT H. MOWBRAY: I haven't heard the previous written discussion, and I must apologize somewhat for the remarks I am going to make, because I have promised myself and really planned to do some preliminary mathematical work in order to better understand this paper before it came up for discussion at this time. Business pressure, as it has a habit of doing, has prevented my doing so. But, if I understand the paper correctly, I am quite at

variance with what I have heard of the earlier discussion. I am very sorry a committee meeting prevented me being here earlier to listen to the entire discussion.

One of the fundamental problems which is presented to us in rate-making is this: Given a certain payroll exposure, in a particular classification (a million dollars, four million dollars, one hundred million dollars), and a given pure premium indication, upon which it is hoped we may be able to predicate a future rate, is the payroll exposure sufficient that we may properly predicate a future rate upon that exposure? I raised that question in a paper presented at the first meeting of this Society (*Proceedings*, Vol. I, p. 24), and, as I take it, Mr. Fisher's paper is intended to show us methods, improved methods over those I suggested at that time, for attacking that problem.

I don't understand that Mr. Fisher intends to suggest to us new ways of rate-making, but rather new ways of analyzing our experience from the standpoint of whether or not it is a satisfactory experience for future rate-making. In that way, Mr. Fisher would undertake, as I take it, in considering an American experience, to first test it for stability; that is to say, to determine whether the influences producing losses were steady or fluctuating in their operation during the period under observation.

I am afraid, from what I have seen of our recent American experience, that he would early come to the conclusion that there were changing influences, such as changes in compensation laws, etc., for which we would have to allow. But assuming that the experiences then have passed that test, as I interpret his paper he proposes that we take certain methods to determine whether the experience in a given classification or group of classifications is sufficiently broad to justify making a rate from it, or, assuming that we have made a rate from it, he attempts to answer the question—How far may we expect departure in our future experience from the rate basis, from the basis of our rate-making?

Now, from that point of view, without, as I say, having had the time to critically analyze Mr. Fisher's method, I think this paper is a very important paper and one to which we should all give very careful consideration, because it appears to give us a very useful tool.

MR. ARNE FISHER:

(AUTHOR'S REVIEW OF DISCUSSIONS.)

First of all I wish to mention that none of my critics present at this meeting have noticed the greatest error in my paper. It is curious that this error was found, not here in America, but in two so widely differently located places as those of China and England.

I recently had a letter from a Mr. Kai Chi Chow, in Shanghai,

wherein he states: "Your coefficient of disturbancy has interested me greatly, but also somewhat disturbed my peace of mind, because I am not able to verify your results."

Then I received another letter from Mr. W. R. Strong, of London, England, who happens to be a member of our Society. To Mr. Strong belongs the credit of calling my attention to the fact that the Bernoullian dispersion as computed on page 243 was assigned the value of 1.5601, whereas it ought to be 0.15601. In other words, the decimal point is in the wrong place. This gives the Charlier coefficient of disturbancy a value of about 7, which must be considered high. Hence my conclusions at the top of page 244 are absolutely erroneous.

This error, however, is due to careless computation and not to the method, and it is a rather significant fact that it has been completely overlooked here in America and discovered in two almost antipodal parts of the earth.

With these preliminary remarks I shall proceed to answer the various criticisms of my little note. Mr. Kopf states in his remarks that it will be of more service to define the difficulty certain members have in applying modern statistical analysis in their daily work than "to discuss the details of Mr. Fisher's applications of higher statistical analysis to a single rating problem." The very fact that Mr. Kopf does not intend to discuss the paper itself necessitates no further comment on my part. I agree, however, fully with the speaker's remarks that "many of our members have a false sense of security in dealing with statistical data," and that tests are required for stability and frequency distribution. These requirements I have always emphasized in the short papers I have submitted to the Society.

The admission by Mr. Michelbacher that he "made an error in reaching the conclusions which he submitted in his written discussion," and the subsequent withdrawal of this discussion, makes further comment superfluous on this rather unfortunate episode, which properly may be ascribed to a somewhat youthful effervescence of Mr. Michelbacher. I might therefore properly add a quotation from the English mathematician, Chrystal, "that the indiscretions of a great man should be quietly allowed to be forgotten."