Since the revised formula for B is K(1-W) the modification formula may be modified to

$$M = \frac{A_p + WA_e + (1\text{-}W)\ (K+E_e)}{E_p + WE_e + (1\text{-}W)\ (K+E_e)}$$ where $(K+E_e)$ would be calculated for each risk with no table look-up for B.

This in turn suggests a procedure for interstate rating during the transition period until approval of the revised formulas can be secured in all states. Under the present interstate rating procedure B and W values are calculated for each state on the basis of the risk's total expected losses and are then weighted by the expected losses for each state to determine average B and W values to use in the rating. During the transition period, let the term common to numerator and denominator for states using the revised formulas, namely $(1\text{-}W)\ (K+E_e)$, be set equal to B'. A value of B' for each new-formula state could be calculated using $K = 7{,}500$, E_e equal to the total expected excess losses for the risk using old-formula states and new-formula states, and (1-W) calculated on the basis of a W value for each new-formula state calculated on the basis of the total expected losses for all states included in the rating. Then B' values for the new-formula states could be averaged with the B values for the old-formula states to determine an average B value. Average W values could be determined as at present, and the calculation of the interstate modification could then proceed in the usual manner.

When all states have adopted the revised formula, it can be demonstrated that the average value of B', as defined in the previous paragraph, is equal to $(K+E_e)\ (1\text{-}W_{aver.})$. Therefore there would be no need to calculate values of B' by states; an average W value calculated in the usual manner would be sufficient.

In closing it may be noted that the Subcommittee recommended a universal Q-point of 10,000 and a universal K value of 7,500. If the self-rating points could be consolidated into only a few different values, the number of tables of W and B values required could be greatly reduced from the present number. The Subcommittee is currently investigating the possibility of a revised basis for establishing the self-rating point.

DISCUSSION BY R. A. JOHNSON

Mr. Uhthoff is to be congratulated for a fine technical analysis of the various components of the Multi-Split Experience Rating Plan. Were certain of his suggestions to be adopted, particularly his proposed method of determining primary losses, the Plan could no longer be called by that name, as is proved by the title of his paper. This paper should be, or may already have been, of considerable value to the Subcommittee of the National Council Actuarial Committee on whose shoulders the task of considering possible revisions of the Experience Rating Plan has been placed.

While admiring the excellent handling of technical details on the one hand, this writer failed to be impressed by Mr. Uhthoff's underlying premise, namely, that a major change in the present Plan is required. The school of thought to which I happen to belong holds that experience rating, particularly for Workmen's Compensation insurance, is a means of producing a better rate for a particular risk using, within certain limitations, the recent past experience of the risk to modify the manual rate which would otherwise be applicable.

The Multi-Split Rating Plan was developed with the expressed purpose of penalizing frequency rather than severity. Besides a substantial cutdown of costly cases in determining primary losses, the Plan also utilized Average Death and P. T. values, which spread the cost of such cases over all risks which incurred them, disregarding the magnitude of a particular case, which was felt to be chiefly fortuitous. Under this Plan, a risk having a single $20,000 case could receive a credit, while a similar risk having twenty $1,000 cases might receive a substantial charge, because frequency is penalized.

It is interesting to note that some years ago, the late Arthur Bailey developed a modification of the experience rating plan in which the first $1,000 of any accident would be primary, the next $9,000 would be regular excess, and anything over $10,000 would be a sort of super excess to be spread over all risks. Here again, the occurrence was the important factor, rather than magnitude. Because of the simplicity of the "split," it was contemplated that the same system could be carried over into manual ratemaking, and eliminate some of the disadvantages of the serious, non-serious and medical categories now used therein.

The other school of thought apparently considers experience rating as a system of rewards and penalties for past experience, and feels that costly cases should be more fully recoverable under the experience rating program. The proponents of this theory were successful several years ago in eliminating Average Death and P. T. values, such cases now being used in rating at their actual values, subject to an extremely high maximum limitation. These people now seem to be disturbed by the gradually decreasing D ratios as indicated by the following quotation from Mr. Uhthoff's paper:

> ". . . the maximum primary loss is $1,500. Probably this limit, and the rapidity with which it is approached, has operated most strongly to accelerate the decrease in D ratios as case costs increased, and also has been the source of most of the discomfiture felt by practical underwriters as they observe the small use of today's high cost cases in a majority of ratings."

Since the advocates of the "rewards and penalties" school were successful in eliminating Average Death and P. T. values, it is likely that they will prevail in revising the Plan to give more emphasis to costly cases. If and when such revision is deemed necessary, Mr. Uhthoff's paper will serve as an excellent guide for accomplishing their desired goal.

DISCUSSION BY E. S. ALLEN

The discussion of the above paper by Mr. Johnson has prompted me to make a few remarks wherein I disagree to some extent.

Mr. Johnson describes a school of thought which "apparently considers experience rating as a system of rewards and penalties for past experience, and feels that costly cases should be more fully recoverable under the experience rating program." As an illustration, he refers to the elimination of the use of Average Death and P. T. values. This change was made in order to better reflect the differences in the averages of high cost cases by classification, since it was maintained that the character of the work in certain classifications required the hiring of highly-paid employees and such employees tended to have more dependents, therefore developing higher death and permanent total claims. In effect, this change limited such losses within a range from zero to twice the average which had previously been included for all such cases. This limitation, combined with the split of losses between Primary and Excess accomplished the objective while still maintaining a reasonable relationship between frequency and severity.

Mr. Johnson also states that this same "school of thought" is likely to "prevail in revising the premium to give more emphasis to costly cases" through a revision which will increase the average D ratios. When the Plan was adopted in the early 1940s, it was an excellent plan and without major change can probably still be considered an excellent plan. However, the eligibility requirements were at that time average annual premiums of $300, $400 and $500, varying by state, and the Multi-Split feature applicable to individual losses was on the basis of full loss up to the amount of eligibility requirement and a two-thirds discount ratio applied as a geometric progression to each successive portion of the loss equal to the eligibility requirement. We can assume, therefore, that a risk which received a specific modification at that time would receive a quite different modification today, using the same rating values, since the expected losses and the actual losses would have changed materially due to increases in payrolls and benefit rates. A revision of the rating values is therefore indicated, not to give more emphasis to costly cases, but to maintain the general principles adopted when the present Experience Rating Plan was introduced.

DISCUSSIONS OF PAPERS READ AT THE MAY 1960 MEETING

TWO STUDIES IN AUTOMOBILE INSURANCE RATEMAKING

BY

ROBERT A. BAILEY AND LEROY J. SIMON

Volume XLVII, Page 1

DISCUSSION BY L. H. ROBERTS

"Two Studies in Automobile Insurance Ratemaking" by Robert A. Bailey and LeRoy J. Simon, Fellows of our Society, is in this reviewer's opinion one