TABLE 2

RELATIVE LOSS RATIOS
Minimum Bias Method — Third Calculation*

i/j	1	2	3	4
1	.798	.979	1.069	1.286
5	1.050	1.288	1.408	1.693
3	1.186	1.454	1.589	1.910
2	1.236	1.516	1.657	1.992
4	1.921	2.355	2.575	3.095

*Compares to Table D.

A fresh numerical example would have aided considerably in understanding the paper, however, after calculating the above "simple" tables, this reviewer now realizes why the author decided against it.

Mr. Bailey is to be congratulated for his generous contributions to our *Proceedings*.

DISCUSSION BY STEPHEN S. MAKGILL

Mr. Bailey has again contributed significantly to our *Proceedings* with the ideas presented in this paper. The ratemaking technique suggested is designed to utilize to the fullest the predictability inherent in the data of each subdivision created by a multiple classification system. Mr. Bailey accomplishes this maximum utilization by producing all sets of adjustments, or relativities, simultaneously. These adjustments may be either cents or percents or a mixture of both, whichever is indicated by tests for minimum bias. Such a technique represents a significant improvement over the common practice of determining percentage relativities for the divisions of each classification, the appropriate relativity from each class then being applied one on top of another to arrive at the final adjustment for a subdivision.

The requirement of complete reliability of the data for each division of each category imposes a certain limit on the applicability of the method as presented, for it sets a substantial minimum to the volume of experience necessary. This points to the necessity of ensuring that all the rating criteria used are contributing significantly to predictability. By eliminating those that do not so contribute, the volume of experience required may be decreased appreciably. The field of meteorology particularly has made great strides in developing screening methods that might well be adapted to our needs in this area.

Mr. Bailey's iterative method of calculating a set of estimated rates that are unbiased in the aggregate seems rather unwieldy, even for computer operations. Improving these techniques offers a highly worthwhile field for further investigation.

The tests for minimum bias described appear most appropriate, and Mr.

Bailey makes an excellent point in regard to the necessity for combining sets where the data is subdivided too finely for the amount of data available.

Still another highly worthwhile technique is suggested when Mr. Bailey touches on the possibility of making rates in layers. As is pointed out, the layer ratemaking technique is especially effective when a large portion of the total losses are small losses. Accordingly, this method may go a long way to solving the problem of the non-reviewed classification in workmen's compensation ratemaking.

While the mathematics of the formulas presented in the Appendix is sound, this reviewer had some difficulty with the definition of terms included. When we are dealing with all factors as percentages, it is not clear what the combined factors are percentages of. Furthermore the product of four factors, all defined as percentages is referred to as an estimated rate at one point. This apparently should have been referred to as an estimated combined factor.

The Society should be most grateful to Mr. Bailey for presenting these interesting ratemaking methods.