Package rate $= P \times T (D \times I_{BI} \times R_{BI} + D \times I_{PD} \times R_{PD})$ where P,T, and D are expressed as multipliers equal to unity minus the actual discount.

It is interesting to note that although SMP liability rates are still developed directly from the corresponding general liability rates, the SMP experience data is not included in the general liability ratemaking process.

CONCLUSION

The general principles that underlie ratemaking for all general liability lines are the same as those used for other casualty lines. Both premiums and losses are adjusted to current levels; care is taken to reflect trends in the development of claims and their costs. Class rates are determined after a formula analysis of the statistics for individual classes and groups of classes with credibility playing a major role. Most differences between ratemaking for general liability and ratemaking for other casualty lines (and most differences among general liability sublines) are manifested in minor details of procedure. The unique features of general liability ratemaking are the grouping of classifications about certain base classifications for the determination of class rates, and the credibility weighting of state and national data to obtain estimates of a class group's experience in an individual state.

General liability ratemaking procedures are in a constant state of flux. The use of classification groups in rating OL&T was introduced in 1961 and the procedure was modified in 1963. Credibility weighting procedures involving national loss ratios have been used sporadically for OL&T and M&C over the last ten years. In many of its details the procedure described in this paper for M&C represents a departure from past procedures. The various techniques described are examples of the ratemaking procedures used for general liability insurance and do not represent the final method, or only method, of rating the sublines involved.

It is interesting to note that the diverse and changing procedures used for general liability insurance ratemaking have produced very satisfactory results in the past. National Bureau member companies have shown an underwriting profit for these sublines in eight of the last ten years, and achieved an average profit of 4% in the last decade.

DISCUSSION BY PHILIP PRESLEY

One of the more tedious and even discouraging tasks facing the student preparing himself for an actuarial career is gaining an understanding of the various ratemaking systems being used in property and casualty

insurance. His search for the rationale and background behind the numerous steps in the ratemaking process may take him through rate filings (assuming he can readily obtain them) and through thick files. Even then he may not have all of his questions answered. A paper such as Jeffrey Lange's "General Liability Ratemaking" is therefore indeed welcomed. Here, a single source provides a broad outline of the ratemaking systems used in a major line of insurance, and in turn gives direction for further research and study.

After reading Mr. Lange's paper, one does not envy the task confronting the general liability ratemaker. The small volume of experience with which he must work would seemingly preclude any meaningful application of "scientific ratemaking." For example, in the illustration of the overall O. L. & T. rate change calculation in "an average sized state," the premium in the latest policy year is only $662,678. I am sure that a large number of companies write more automobile premium than this in single rating territories, and many times this amount in single states. Yet, this volume might well be considered insufficiently credible to use as a sole base for their own rates.

The magnitude of these problems becomes even more apparent when one considers that these relatively small volumes of premium may be spread, in the case of O. L. & T., over as many as 264 risk classifications as well as several rating territories. It is ample tribute to the various methods developed over the years by the people at the N.B.C.U. and other rating organizations, when it can be said that an underwriting profit has been realized in the general liability sublines in eight of the last ten years. Few other casualty lines can make such a boast. I might add that this fact about the profitability of general liability insurance becomes especially intriguing in the face of Mr. Lange's comment relative to the proposed statewide rate level change for his O. L. & T. example: "As is frequently the case in general liability insurance ratemaking, the proposed change is somewhat less than the indicated rate change."

The problem of low credibility classes or territories is, of course, common to almost all lines of casualty and property insurance. In the field of workmen's compensation, for example, studies are currently being made in an attempt to make the rates of the no credibility or "non-reviewed" classifications more responsive to their own experience. A partial step in this direction was taken, as noted in R. M. Marshall's "Workmen's Compensation Insurance Ratemaking" (1961 revision), when the credibility criteria were lowered. However, there is still a residuum of classifications in

each state which receive little direct credit for their own experience. The final answers have not yet been found and much work still remains to be done. We can hope that approaches such as those used in general liability ratemaking will generate ideas which can be applied to other lines.

While Mr. Lange has presented us with a very valuable addition to our *Proceedings,* I would be failing in my obligations as a reviewer if I, as a student, did not also comment on its shortcomings. A paper such as this, which will be used as a text for those entering the actuarial profession and as a reference source for those who wish to learn more about general liability ratemaking, should have each important step in the procedure accompanied by appropriate exhibits and examples. This allows the reader to work through the various steps, effectually recreating the rate revision as he reads through the material. Ideally, it should show all of the information which would be contained in a typical rate filing, as well as appropriate supplementary information, even if this were to be, as in the present case, for a single subline.

In his apparent quest for brevity and conciseness, Mr. Lange unfortunately omitted many details which would have permitted a greater appreciation and understanding of general liability ratemaking. He stated, for example, that the calculation of the loss development factors followed the procedures outlined by Phillipp Stern in "Ratemaking Procedures for Automobile Liability Insurance"[1].

With reference to the exhibit showing the determination of the overall O. L. & T. rate change, however, this reference to the calculation of loss development factors does not answer many of the questions which come to mind, especially to students of the Society. For example, the four policy years 1959 to 1962 all have the same loss development factor. Does this mean they are at the same valuation? If not, what are the respective valuations? Another question might be to what valuation are these losses developed? Finally, we might inquire what data is used to calculate the loss development factors. Is it countrywide or regional or state O. L. & T. experience? Does it include other sublines, say M. & C.?

While the answers to these questions may be relatively obvious to many actuaries, to students like myself they may not be quite so clear. Unfortunately, the material contained in this paper is insufficient to draw any definite conclusions. Two other examples come to mind:

1. First, the description of the average paid loss trend factors is lim-

[1] *PCAS, Vol. LII* (1965), page 139.

ited to a reference to Paul Benbrook's paper in the *Proceedings*[2] and Richard Lino's review.[3] The calculations shown in those sources are designed primarily for calendar-accident year data, however. While the transition to a policy year base would not be particularly difficult for the reader to make, it would have been helpful had an actual calculation been shown. And, as in the case of the loss development factors, there is no indication as to what paid loss experience is used.

2. Secondly, it is not intuitively obvious why some sort of trend factor should not be used for those sublines where the exposure base is payroll. While inflationary pressures admittedly affect both claim costs and wages, the effect is not necessarily the same. Claim values are tied in part to medical costs which have been spiraling at a rate much greater than the economy as a whole. The outlook in the near future is perhaps even worse. Pain and suffering awards have been increasing rapidly. While the use of basic limits losses does have a truncating effect on the inflationary increase in claim costs, the payroll limitation has a similar effect on payroll, especially in the handful of states still using the $100 rule. These problems have undoubtedly received the attention of the staff and committees of the National Bureau, but it would have been informative to give a more expanded treatment to this problem.

In spite of the above examples and the other areas in which one might have wished a more detailed treatment, Mr. Lange has presented a valuable paper for both students and actuaries, providing good insights into the problems and procedures of general liability ratemaking. Such papers have, however, the discouraging tendency to become outdated in an amazingly short time. As Mr. Lange says in his conclusion, "General liability ratemaking procedures are in a constant state of flux." We sincerely hope that he will provide us with frequent supplements to this paper.

DISCUSSION BY S. C. DU ROSE

The author presents an explanation of general liability insurance rate making and rate filing procedures of the National Bureau of Casualty Underwriters. To this extent, the paper is of substantial value to the student or other interested person.

In my initial reading of the paper, I was bothered by the absence

[2] *PCAS, Vol. XLV* (1958), page 20.
[3] *PCAS, Vol. XLVI* (1959), page 301.