in terms of which arithmetical differences are indentifiable by established statistical tests. On the other hand the value spectrum for other than dwelling properties is sufficiently wide that it may be quite unsatisfactory to treat the loss cost per segment of insurable value as if it were a constant.

The author (unjustifiably in the reviewer's opinion) seems to slight her paper as solely an introduction into an area of prime concern for the property-casualty insurance industry. It is much more than that. At the same time there is a need to continue the research into the expected distribution of losses by size, particularly in conjunction with the probability of loss occurrences by hazard, by classification of risk, and by area. Certainly such findings should be of value for establishing credibility criteria, although there may be actuaries who would prefer not to consider these standards as exclusively an exercise in mathematical statistics.

Miss Salzmann is to be commended for her valuable and thought-provoking research. It should be an incentive for other actuaries to contribute to the problem of determining the expected distribution of losses by size and its possible nexus with the industry's rating needs.

DISCUSSION BY ROBERT POLLACK

One of the truly important phenomena of our business in recent years has been the desire and ability of the industry to experiment successfully with new methods of providing coverage. Basically, we have been insuring most of the major property and casualty hazards for many years. However, the scope of coverage of these hazards has been changing markedly and, I am certain, will be subject to more change in the future.

Miss Salzmann's paper suggests a method for dealing with this changing pattern. By arranging losses in an accumulated loss cost distribution, she has offered a means of coping with coverages other than complete first to last dollar protection for lines of insurance in which "an increase or decrease in the insured amount for any one risk does not necessitate a proportionate change in the premium charge." The need for this type of study is obvious, and yet practically no research had been made in this area heretofore.

The method used is not completely new. In the casualty field, Table M is based on a similar approach in that the insurance charges and savings derive from arranging the spectrum of risk loss ratios. The Society of Actuaries has been working for years on similar studies, notably in the field of health insurance. In these latter studies, continuation tables have been developed which can be used in measuring the non-proportional effects of changing the maximum duration of benefits, the waiting period before benefits are payable, etc.

Miss Salzmann has chosen INA'S 1960 homeowners fire losses as the experience base for this study. The fact that this represents a relatively small block of exposures opens the question of credibility of the numerical results shown in the exhibits and charts. As an example, the data in Exhibit C-1 show that losses in excess of 10% of insured value represented 5% of the to-

tal number of losses (226 out of 4,862) but 63% of the total dollars of losses ($1,264,261 out of $1,981,703). Exhibit C-2, based on experience of Brick-Protected classifications, is the result of an even smaller block of exposures. If the data does, in fact, lack credibility for purposes of developing a size of loss distribution, they are still of considerable value. In measuring the effect of such coverage adjustments as deductibles and franchise clauses, relatively large distortions at the top end of the distribution would probably have little effect on the rating of these in that the deductible or franchise cut-off point is usually set so as to eliminate only the smaller claims (i.e., small in relation to the value of the property insured). Even if the credibility of the data is subject to question, I believe that, in fairness to the author, this paper was meant to outline an approach for future study rather than to produce a set of tables for use in ratemaking.

The author has mentioned several pitfalls which must be watched by anyone who intends to do research into this type of analysis. First, the obvious question of credibility. As mentioned above, the biggest problem lies in the upper end of the scale. If, for example, such a distribution were used for rating a reinsurance program, important errors could result. If losses up to 90% of value for the Frame Protected classification were 98% instead of the 98.9% shown (Exhibit C-1), the underwriting results of rating the excess of 90% based on the table values would be catastrophic. The use of other methods such as the suggested "X^{th} largest loss" approach is still only as good as the credibility of the data being used. In summary, then, two separate but interrelated criteria of credibility must be used in any curve-fitting attempt. The data must be sufficiently credible so that the overall results are reasonable and, depending on their ultimate usage, the segments of the curve must also stand the test of credibility. The latter is by far the more important of the two.

A second potential pitfall, which the author recognized and carefully avoided, is the temptation to combine data for the sake of building credibility but, in so doing, producing a fruit salad that is of no use at all. In this study, homeowners fire losses were used for a relatively tight range of values for a homogeneous classification. There is enough evidence that: (1) had extended coverage losses been included; (2) had very different property values been combined; and (3) had different classes been put together, the results of the study would have been meaningless. I realize that the problem of limited data makes such combinations tempting. As the author realized, a detailed analysis of data which have no practical application is worse than no analysis at all.

In conclusion, I want to commend the author for opening the door to future study in an extremely important area.