

ADJUSTMENT OF PREMIUMS UNDER GUARANTEED
RENEWABLE POLICIES

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THE guaranteed renewable, adjustable premium policy is a unique new instrument in the array of insurance mechanisms available to the Accident and Sickness Insurance industry. It can be expected to develop its own unique set of problems. It has been the writer's impression that considerable vagueness exists within the industry as to the interpretation that is to be given to the premium adjustment provision. Moreover, more than one company has entered this new field, relying confidently upon its right to revise rates, while at the same time giving little thought as to what approach it plans to take should a revision of rates actually become necessary. While it is obviously impossible to anticipate all of the conceivable situations which may arise, it is desirable to consider several of the more likely ones, with an eye to setting some tentative policy for dealing with them. Furthermore, as later illustrations in this paper will show, that tentative policy may have a significant effect upon the original scale of premiums which is adopted.

The words and concepts associated with the guaranteed renewable adjustable premium medium appear to be in need of further clarification.¹ Not all of us in the business mean the same thing when we talk about them. We differ among ourselves as to the importance of certain potential difficulties. It is not to be expected that complete unanimity of opinion and interpretation should exist, but it is clearly desirable that we come to a clear understanding of the legitimate alternatives and the areas of agreement and disagreement.

Now is the time to clarify the alternative views and anticipate the problems, rather than after they have manifested themselves at some future date when past mistakes, precedents and regulatory rulings may have proceeded to the point where it could become very difficult to rectify matters satisfactorily, with consequent damage to this valuable insuring medium. The Insurance Departments can be expected to give minute scrutiny to the first several filings of revised rates, and it would be well to reach, before that time, as broad an area of clarification and understanding of the subject as possible.

This paper embodies an attempt to sort out and to analyze the rather

¹ For a brief statement of principles surrounding the adjustable premium concept, see Mr. Valentine Howell's remarks in *TSA VIII*, pp. 76-77.

complex concepts, to clarify some of the alternatives, and to suggest something by way of solution, if indeed any solutions are really needed. It is hoped that this study will provoke careful appraisal and discussion of the problems and principles involved.

I. THE INTENT OF THE PREMIUM ADJUSTMENT PROVISION

Three major categories of insurance contracts are employed in the individual A&S field with regard to the continuation of coverage. These are the "noncancelable," or guaranteed premium contract, the "guaranteed renewable," or adjustable premium contract, and the optionally renewable contract, which sometimes takes the variation of a contract cancelable by the Insurer between renewal anniversaries.

The adjustable premium contract was developed to meet the situation where the Insurer is prepared to guarantee the unrestricted continuation of coverage, at least to some stipulated age, but is not prepared to guarantee his estimate of the cost of protection throughout the period of guaranteed continuance. Thus, in its most generally accepted form, it provides exactly the same guarantees as does noncancelable insurance with the sole exception of guaranteed price. We will concern ourselves in this investigation only with the "level premium" form of the adjustable premium contract (*i.e.*, as distinguished from step rate or flat rate premium structures), where, in spite of the absence of a guarantee that the rate will in fact remain level, it is nevertheless computed on a basis which contemplates, at the time of issue, the charging at each renewal date of a level premium determined according to original age classification at date of entry.

The kind of situation that calls for an adjustable premium contract is one where the future hazard is abnormally unpredictable, either because it is known or suspected to be prone to wide fluctuation on account of various uncertain influences, or else because the hazard has been insufficiently measured, the statistics being too scanty or too immature. In the Accident and Sickness field, the degree of this unpredictability proceeds through increasing stages depending upon the type of benefit. The most predictable hazards would seem to be the fixed benefit or closely scheduled types, such as accidental death, loss of time, daily hospitalization indemnity, and scheduled surgical benefits, although some of these exhibit sufficient variability of cost as to suggest that they may be best handled on the adjustable premium basis. The most thoroughly unpredictable costs are obviously associated with such high limit unscheduled coverages as are commonly provided under major or comprehensive medical insurance, where the uncertainty as to future medical expense levels compounds the problems of changing medical practice and rates of utilization.

It has been argued that the original level of adjustable rates should not differ greatly from what might be regarded as an adequate guaranteed rate, on the ground that an adjustable rate too much lower is evidence that the Insurer has placed excessive reliance upon his right of rate revision. It should be clear, however, that the degree of departure of the adjustable from any presumably adequate guaranteed rate is a function of the degree of unpredictability. Only a very modest variation could be justified for an accidental death benefit and somewhat more, perhaps, for time loss. But under high limit, nonscheduled medical insurance, a safe level of guaranteed rates would be so far above prevailing adjustable rates that most actuaries would decline even to attempt their computation for purely comparative purposes, regarding the task as an impossible undertaking. The future simply abounds with too many unknowns.

Superficially, the adjustable premium principle appears simple. The Insurer guarantees unrestricted continuation of coverage, but does not guarantee the price. Problems immediately arise, however, from the viewpoints of Insurer, Insured, and regulatory authorities. At what point is the Insurer justified in initiating a revision? Only after demonstrable losses have already been sustained, or as soon as trends indicate an emerging deficiency? What is to prevent the Insurer from adopting "freeze-out" increases, in order to effectively nonrenew a troublesome block of business? What will prevent the selling of new business at deliberately inadequate rates, with the intention of increasing the cost at renewal, thus provoking dangerous and unfair competition? How effective will the revision mechanism really prove to be in enabling the Insurer to keep the business self-sustaining? Will increases merely serve to instigate an assessment spiral?

Let us first consider the fundamental rights of the contracting parties as implied by the premium adjustment principle.

The Insurer

The adjustment principle implies the right of the Insurer to make revisions as required to keep the business self-sustaining, including reasonable margins for contingency and profit. In other words, the Insurer has the right to adjust price in order to avoid expected future loss. Short of this, the principle lacks meaning.

Has he the right to recoup past losses? The answer would seem to be "No." A premium is paid as consideration for the coming renewal term to which it applies. Thus, in setting the rate, the Insurer has no right to load that rate for losses pertaining to a past term. The previous premiums should have been originally set at a level at least sufficient to sustain the

business through their terms, as regards that period's cost of insurance. In other words, on the level premium basis, past premiums should have been sufficient to cover the cost of insurance to date, that portion of expenses contemplated originally to have been amortized to date, and the contribution to active life reserves, contingency reserves, and surplus which should be standing at date. Certainly at least this degree of foresight may be reasonably demanded from the Insurer. Any deficiency is not properly recoverable through a revised rate, for this rate applies only to the future.

Two significant corollaries arise from these considerations.

- a) *The Insurer should not be obliged to sustain actual loss before effecting a revision.* It would be a clear violation of the Insurer's right if filings of revised rates were to be disapproved on the ground that actual developed losses have not been demonstrated. It should thus be sufficient to demonstrate that the experience points to an emerging loss if revision is delayed, and the Insurer should be allowed reasonable latitude in anticipating such loss, so long as the experience is definite enough to indicate its probability.
- b) *The Insurer should not be obliged to absorb a deficiency in prospective reserves.* From what has been said, it should be clear that we are not referring to any reserve arising from a retrospective gross premium valuation.

The reserve referred to here is the prospective reserve, valued in terms of the revised expectations. The Insurer should be allowed, therefore, to charge a revised premium sufficient to overcome any difference between the prospective gross premium reserves valued, as of the date of revision, upon the revised and upon the original assumptions respectively. Otherwise, the Insurer is being denied his fundamental right under the adjustment provision.

Other considerations, of course, may arise to modify the revision actually adopted in practice. The Insurer may feel that the full increase will provoke dissatisfaction or excessive lapsation. He may decide to apply the same revision to several blocks of business not strictly of equivalent expected cost for reasons of practical simplicity. But such practical considerations should not be permitted to obscure the fundamental principle, or serious confusion and unsound conclusions are apt to result.

The Insured

The rights of the Insured under the now generally accepted form of the provision are as follows.

- a) *Preservation of original classification.* The Insured is accepted by the Insurer as a member of a particular class of risks. The level premium he pays is applicable to that class. Consequently, he has the right to continue in his original classification. This includes both his right to be charged the rate applicable to that class, subsequent to any revision, and also his right to continuation of coverage without later modification of benefits or attachment of restrictive endorsements, except to the extent any such changes are legitimately and adequately provided for in the original contract (e.g., reduction of benefits upon attaining age 65). There are certain cases where limited reclassification is in order, but if the Insurer intends this, he should specifically provide for such reclassification in the original agreement. In the absence of such a provision, the Insurer has no right to reclassify. We will return to this point later.
- b) *Preservation of level premium equity.* This is ordinarily covered in the provision by specifying that any rate revision will be based upon the original insuring age, and might be considered as implicit in the right of original classification. However, it is well to recognize this right specifically, and to realize that the intent of the original age basis is the protection of the Insured from forfeiture of the reserve equity accumulated under his prior level premiums through the adoption of a revised rate that in effect reclassifies the Insured by attained age, or the like. This is also the only meaningful way to interpret the "level" premium nature of the contract, since, if rates are revised, the premiums are plainly not altogether level. The most logical approach is to regard a revised rate as a *continuation* of the original level rate, together with a superimposed increment designed to pay for the incremental expected costs which are the occasion for the revision (which, conceivably, are either positive or negative).

There are three possible interpretations of the "original age" basis of rate revision.

- (i) The revised rate is the original level rate plus (or minus) an increment equating to the increment in expected costs, computed, by the very nature of the matter, according to the attained age of the Insured at time of revision.
- (ii) The revised rate is the rate, recomputed as of the original age, which would have been originally charged had the revised assumptions been used.
- (iii) The revised rate is the rate which is currently applicable to present entrants of the same age as the original age of the Insured whose rate is being revised, computed according to the revised assumptions.

Interpretation (i) is the only one of the three that is consistent with the rights of both Insurer and Insured. (ii) and (iii) clearly maintain neither equity nor the Insurer's right to charge a sustaining rate (depending on the circumstances), and, moreover, have no basis whatever in actuarial logic. If they have any defense, it must apparently be sought in the legal logic of the contract language. This would seem to be the only explanation for the rather wide acceptance currently accorded interpretation (iii), which is easily more illogical than even (ii), since current entrants, being underwritten at a different time, and insured over a different interval of time, may well be subject to a considerably different pattern of costs than the original group. If interpretation (i) cannot be upheld by the contract language referring to original age, then the language would seem to be in need of clarification, since this is plainly the meaning the words ought to have. This is not to say that a practical latitude should not be permitted. Under many circumstances, the actual rate produced under method (iii) will differ but little from that produced by method (i), as will be shown shortly, and some Insurers expect to use method (iii) in practice as a satisfactory approximation in effect, in order to utilize the practical simplicity of a single rate table applying to all durations, or at least to a wide range of durations. It is debatable whether method (iii) will be satisfactory under all circumstances, however. It is one thing to adopt method (iii) as a practical recourse where suitable. It is an altogether different matter to make the error of regarding (iii) as the theoretically proper approach. What is needed, therefore, is a provision that properly recognizes interpretation (i) as the actual basis, yet permits sufficient practical latitude so that approximations in effect, such as are produced by (iii), may be employed if suitable.

- c) *Preservation of the financial possibility of renewal.* The Insured must have this right against the eventuality of a deliberately "freeze-out" rate increase, in order to give real meaning to the guaranteed renewability of his contract. Conceivably, actual experience could be such that the Insurer must impose increases of such size as to leave many policyholders financially unable to renew, or at least put them in the position where it does not appear to be worth it. If such an increase were needed to prevent serious loss to the Insurer, it is evident that the situation is one amounting to a genuine "conflict of rights." The only resolution is to take the position that the amount of increase must be justified by the Insurer's experience, so that the price is really fair in terms of the actual prospective value of the benefits. Thus the Insurer should be expected to provide reasonable justification for the increase,

to rule out the conclusion that it is actually a deliberate device to effectively cancel out the group.

- d) *Initial charge computed on a basis contemplated as truly level.* This right protects the Insured from the eventuality of a deliberately inadequate initial rate set by an Insurer with the intention of revising rates after getting business onto the books. It is also a vital protection to Insurers against unfair and unsound competition. There are severe limitations to the establishment of a rate truly contemplated as "level" in the case of medical insurance subject to future inflation in medical cost levels. Such a rate would necessarily involve inflation projection factors and create the attendant difficulties of deciding how much projecting is reasonable, not to mention the competitive obstacles. The most realistic approach would seem to be to require rates to be at least adequate in terms of current levels, especially those rates applying to new business issued following a revision on existing business. If an Insurer's new issue rates are drastically below the prevailing industry levels, or, in particular, so far below its own renewal rates on comparable in-force business as to suggest inconsistency, it would seem reasonable to require such an Insurer to clearly demonstrate that the new issue rates are not inadequate in terms of current expected costs.

II. TYPICAL PREMIUM ADJUSTMENT PROVISIONS

It is instructive to review briefly typical examples of policy provisions that have been used. We will consider five, using wording that is intended to be more or less representative of each type rather than the actual language used by particular companies.

Clause 1. This policy may be continued in force by payment of each premium when due as provided herein, at the Company's applicable table of rates effective on the date each such premium is due.

This clause says as little as possible, and leaves maximum latitude to the Insurer. It makes no specific statement at all about the rights which have come to be accepted as the entitlement of the Insured under the generic type of policy labeled "guaranteed renewable." For this reason, some Insurance Departments will not currently approve this language.

Clause 2. The Company reserves the right to change at any time, and from time to time, the table of rates applicable to premiums thereafter becoming due under this policy. If a change is made in the applicable table of rates, there will be no change in the classification of the Insured solely on account of any physical impairment or solely on account of any claims incurred under this policy, nor shall the Company have the right to attach any restrictive rider to this policy applying to coverage already in force.

This clause goes much further than Clause 1 in setting forth the rights of the Insured. It does not categorically rule out reclassification, nor does it say anything by way of specifically preserving the level premium equity of the Insured.

Clause 3. The amount of each renewal premium shall be determined from the Company's applicable table of rates in effect on the due date thereof, and the Company reserves the right to change from time to time the table of rates applicable to premiums thereafter becoming due. However, no change shall be made in the table of rates applicable to this policy unless such change shall also be made applicable to all policies providing like benefits and renewal rights and of the same rating class.

This clause sets forth the basis of adjustment in terms of revision on a class basis. No reference is made to level premium equity. Reclassification may be excluded by implication, but is not ruled out specifically.

Clause 4. The Company reserves the right to revise at any time and from time to time the table of rates applicable to premiums thereafter becoming due under this policy. In the event of a revision in the table of rates, the original classification and insuring age of the Insured shall be used in determining the premium according to the new table of rates.

This clause clearly preserves original classification and level premium equity, provided the proper interpretation is given to "original insuring age." In view of the variant interpretations, the wording is perhaps ambiguous.

Clause 5. The Company reserves the right to change at any time, and from time to time, the table of rates applicable to premiums thereafter payable under this policy, provided that the Company's applicable table of rates shall be classified only by original age at entry and by sex and shall apply to all policies theretofore or thereafter issued on this policy form.

This clause is quite restrictive upon the Insurer as to the treatment of all policies of a given form. It forces either interpretation (iii) (assuming the form is still of current issue after a rate revision) or else some over-all average scale of rates at revision applying uniformly to all policies issued under the form. This reference to policy form is somewhat peculiar. Presumably the intent is to create simple, practical boundaries for policy class groupings, although it should be noted that this clause is especially prone to exploitation by an Insurer issuing policies at inadequate rates with the intention of frequent form replacement, thereafter imposing more or less independent increases upon each closed "policy form" block. It might be advisable to require such an Insurer to demonstrate that its

revised rates are actuarially consistent, not merely within the classes represented by each block, but also with rates for comparable coverage presently being issued on current forms, especially if forms have been replaced so frequently as to preclude the possibility of a credible volume of exposure within any block. However, if a given block represents sufficient exposure to furnish credible justification for the revision, this demonstration of consistency with current rates would be unnecessary provided there is not otherwise evidence of continued inadequacy in new issue rates. To the extent that the same form is continued current over a considerable span of time, the Insurer has no choice but to charge the same revised rate for all durations, as well as to revise rates automatically on all existing business under the form if any new rate table is made effective for new issues. The clause would thus seem to create a number of awkward potential problems.

III. ILLUSTRATIVE SITUATIONS PRECIPITATING RATE REVISION

It is helpful, in any effort to develop an adequate practical approach to the administration and computation of adjustable rates (both before and after a revision), to consider some of the possible situations leading to the necessity of a revision, and the effect of these situations upon the Insurer's over-all costs and liabilities. This is not an easy undertaking. There are so many possible developments that could precipitate a rate revision, so many variations among the companies in gross premium loadings, so many factors, aside from these basic two, that could influence the actual decision, that illustrative calculations seem rather like proposing conclusions about an entire race of people by studying a single member individual.

Still, the attempt is informative, shows what *could* occur, and provides some rough idea of whether certain approaches are or are not likely to be satisfactory in certain instances. We will treat each of the following in specific terms:

1. Medical cost inflation, resulting in expected morbidity too flat by duration, as well as increasing by year of issue.
2. Expected morbidity too flat by advancing age.
3. Expected morbidity insufficient by a more or less constant percentage at all ages and durations.

Several other eventualities will be treated in only a general way.

Since the premium to be revised is the gross premium, the significant question is what happens to this, rather than what might happen to valuation or experience net premiums. Consequently, let us assume a hypo-

thetical gross premium formula representing fairly accurately the distributed expenses of some hypothetical company. Our assumed expenses are not intended to represent any particular actual situation, nor is the formula or method of loading presented in any sense as a recommended one. It is purely illustrative.

Commissions: 50% 1st year, 15% renewal indefinitely.
 Overhead and margin: 40% 1st year, 15% renewal indefinitely, plus an additional \$10 per policy in the first year. (Per policy renewal expense is assumed to be covered in the 15% renewal, since we will deal with only one benefit.)

Mortality and lapsation: Mortality survivorship according to the 1941 CSO Table, with lapsation of 30% of the mortality survivors the first year, 15% the second year, 7.5% the third year, and no lapsation assumed after the third year.

Interest: 2½%.

We will assume a major medical policy (as perhaps the best example of a currently "unpredictable" coverage), providing 75% insurance over a \$500 deductible up to a \$7,500 maximum, without inside limits. The Company adopts C. N. Walker's costs² for a \$25 room limit, \$500 deductible, \$7,500 maximum as expected current ultimate morbidity, assuming select morbidity at 60% and 85% of ultimate in the first and second years, respectively. We will use the male costs.

Inflation in Medical Cost Levels

In order to analyze the potential effect of inflation upon experience, it will be convenient to define a special set of projection functions and symbols.

$$H_x = \frac{1}{2} (D_x + D_{x+1}) S_x \quad \dot{H}_x = (1 + j)^x H_x$$

$${}_zK_x = \sum_x^{z-1} H_x \quad {}_z\dot{K}_x = \sum_x^{z-1} \dot{H}_x$$

where *j* is an assumed annual rate of claim cost inflation, and *z* is the age limit of coverage.

² Discussion of "Gross Premiums for Individual and Family Major Medical Insurance" by Morton Miller, *TSA* VII, 408. Commutation functions for the same costs are given in *TSA* XI, pp. 348 ff.

In our illustrations, we will assume $j = .05$. Rounded values of $\overset{.05}{H}_x$ and $\overset{.05}{K}_x$ are provided in the Appendix for reference.

$\overset{(u)}{+}_0^0 G_x =$ A gross annual premium applicable to some initial base year n , with respect to which assumptions as to future inflation are projected for u years into the future, the level remaining stable thereafter. The rate of inflation requires auxiliary definition.

$\overset{(u)}{+}_s^s G_x =$ A similar gross premium applicable to the year $n + s$, s years following the base year n , projecting u years beyond year $n + s$.

$\overset{(v)}{+}_s^{(t)} G_x =$ The theoretical increment in gross annual premium required to sustain an increase in expected costs, projecting for a number of additional years such that the total years of projection = $t + v$, the increment relating to year $n + t$ and later, where the original premium was applicable to year $n + s$ at original issue age x .

$\overset{(v)}{+}_s^t G_x =$ The adjusted gross premium, applicable to a revision in year $n + t$ of a premium originally applicable to year $n + s$ at age x , so that

$$\overset{(v)}{+}_s^t G_x = \overset{(u)}{+}_s^s G_x + \overset{(t)}{+}_s^{(v)} G_x .$$

$\overset{(w)}{+}_s^{(r)+t} G_x$ and $\overset{(w)}{+}_s^{r+t} G_x$ will be similar expressions referring to a *second* revision, and so forth.

The total *projection* period from base year n is always equal to the *sum* of the pre-superscripts and the overscript. Thus, in the last pair of expressions given, the total projection = $r + t + w$.

It will be convenient to simplify the formulas by adopting symbols for the following expressions occurring frequently in the gross premium formulas.

$$T_x = .6\overset{.05}{H}_x + .595 (\overset{.05}{H}_{x+1} + \overset{.05}{H}_{x+2})$$

$$U_x = .1D_x + .7 [.7D_{x+1} + .595D_{x+2} + .55 (N_{x+3} - N_{65})] ,$$

so that:

$$T_{35} = 37,998,000$$

$$U_{35} = 2,767,000, \text{ under the assumptions we have adopted.}$$

It is important not to overlook the fact that if we assume 5 percent to be the annual rate of claim cost inflation on a \$500 deductible plan, we

are assuming the actual rate of inflation in medical costs to be something less than 5 percent. To illustrate, let us assume that the average claim produced by the current year's experience equals \$600, thus arising from average charges of \$1,300 for qualifying claims, *i.e.*, $.75 (1,300 - 500) = 600$. Then if, in the following year, the same claims would have produced a \$630 average claim, up 5 percent, we could construct the following equation to obtain the rate of medical cost inflation, k :

$$.75 [(1 + k) 1,300 - 500] = 630,$$

from which we find $k = .031$.

There would also be a small additional loss arising from new claims breaking through the deductible, of small size and therefore of relatively insignificant effect upon total claim losses sustained, but possibly producing a measurable increase in claim frequency and hence, perhaps, significantly affecting administrative expense.

Thus an assumption of $j = 5$ percent is equivalent (for this illustrative average size of claim) to a value of k slightly under 3.1 percent, hardly conservative in view of the actual trend over recent years.

This effect of "deductible erosion" will obviously be greater the larger the deductible and the smaller the average size of claim, and varies widely depending on these two factors. In this example, the ratio of j to k is over 160%. On low deductibles it would be much nearer 100%, while on a very high deductible, such as \$1,000, it can easily exceed 300%.

Case A. Suppose our hypothetical insurer decides to project inflation for 10 years beyond base year n , and, moreover, its new issue rate tables are intended to hold up for 5 years after each revision (of new rates). To achieve this, it computes rates each time to apply to the middle year of each 5-year period. Then at the beginning, for the 5 years starting with base year n , the gross premium for a male age 35 at issue is given by:

$$\begin{aligned} {}_{+2}G_{35}^{(8)} &= \frac{1.05^{-33} [T_{35} + .55 ({}_{65}K_{38}^{.05} - {}_{65}K_{43}^{.05})] + 1.05^{10} \cdot .55 {}_{65}K_{43} + 10D_{35}}{U_{35}} \\ &= \$43.21. \end{aligned}$$

Let us optimistically assume that inflation begins to level out, so that the company releases its second and third 5-year ratebooks without any further projection of ultimate cost levels, and, moreover, needs to make no revision at all in rates on in-force business.

The rate for issue age 35 in the second period is:

$$\begin{aligned} {}_{+7}G_{35}^{(8)} &= \frac{1.05^{-28}T_{35} + 1.05^{10} \cdot .55 {}_{65}K_{38} + 10D_{35}}{U_{35}} \\ &= \$44.79. \end{aligned}$$

And in the third period:

$$\begin{aligned} {}_{+10}G_{35} &= \frac{1.05^{10} \{ .6H_{35} + .595 (H_{36} + H_{37}) + .55_{65}K_{38} \} + 10D_{35}}{U_{35}} \\ &= \$45.14 . \end{aligned}$$

The increase in rates each time is rather modest, because of the fact that all formulas assume the same eventual plateau of stable costs. The rate for the third period is only 104.5% of that for the first 5-year period.

Case B. For the sake of curiosity, let us determine what the initial rate would have been assuming inflation to continue indefinitely beyond the base year, setting that rate applicable to the issues of year n above. We have:

$$\begin{aligned} {}_{+0}G_{35}^{(\infty)} &= \frac{1.05^{-35} [T_{35} + .55_{65}^{.05}K_{38}] + 10D_{35}}{U_{35}} \\ &= \$63.09 . \end{aligned}$$

This rate is 146% of the initial rate in Case A. The company's rates would therefore be completely uncompetitive unless long range projection were the rule in the business. Moreover, many prospects might find it very difficult, in any event, to pay a price in year n that covers inflation projected very far into the future, and such a rate would be, in itself, of inflationary character. If the coverage were lifetime rather than term to 65, far greater disparity would result. The final difficulty in the Case B approach is that such distant projections journey far into the realm of pure conjecture.

Case C. Assume the company adopts a policy of very short range projection. A rate-table is prepared to hold up for 3 years, and forecasts inflation for 3 years only. The intent is that at the end of each 3-year interval, rates will be revised on the basis of 3-year inflation forecast extensions in accordance with trends to date.

The rate for the initial period, computed on the middle year, is:

$$\begin{aligned} {}_{+1}G_{35}^{(2)} &= \frac{1.05^{-34}T_{35} + 1.05^3 \cdot .55_{65}K_{38} + 10D_{35}}{U_{35}} \\ &= \$32.35 , \end{aligned}$$

significantly lower than in Case A.

For the second 3-year period, the theoretical new issue rate is:

$$\begin{aligned} {}_{+4}G_{35}^{(2)} &= \frac{1.05^{-31}T_{35} + 1.05^6 \cdot .55_{65}K_{38} + 10D_{35}}{U_{35}} \\ &= \$37.24 , \end{aligned}$$

up 15.1%, which, of course, is close to an increase factor of $1.05^3 = 1.158$. This factor would apply exactly if the flat \$10.00 policy expense in the first year also inflated 5% annually.

Let us assume that the cost of rate revision is estimated at \$2.00 per policy, and no excess lapsation on account of the revision is assumed. Then the theoretical increment required in the rate for the initial period is:

$$\begin{aligned}
 & {}^{(+3)}G_{35}^{(3)} = \\
 & \frac{1.05^{-34} [\overset{.05}{H}_{37} + .925 (\overset{.05}{H}_{38} + \overset{.05}{H}_{39} + 1.05^{40} \cdot {}_{65}K_{40}) - \overset{.05}{H}_{37}] - .925 \cdot 1.05^3 \cdot {}_{65}K_{38} + 2D_{37}}{7 [D_{37} + .925 (N_{38} - N_{65})]} \\
 & = \$4.88,
 \end{aligned}$$

the factor of .925 being required under our assumptions since the last year of select lapsation still remains.

The total revised rate is then:

$${}^{+1}G_{35}^{(2)} + {}^{(+3)}G_{35}^{(3)} = {}^{+3}G_{35}^{(3)} = \$37.23.$$

This is practically identical with the new issue rate for the second 3-year period and, as a practical matter, the same rate table would certainly be used.

What happens if this same 3-year revision process is continued through several more periods?

After another six and nine years, respectively, the new issue rates will be:

$$\begin{aligned}
 & {}^{+10}G_{35}^{(2)} = \frac{1.05^{-26}T_{35} + 1.05^{12} \cdot .55 {}_{65}K_{38} + 10D_{35}}{U_{35}} = \$49.43, \\
 & {}^{+13}G_{35}^{(2)} = \frac{1.05^{-22}T_{35} + 1.05^{16} \cdot .55 {}_{65}K_{38} + 10D_{35}}{U_{35}} = \$57.01.
 \end{aligned}$$

The successive increments in the rate applicable to the original three-year period of issue are:

$$\begin{aligned}
 & {}^{(+3)}G_{35}^{(3)} \\
 & = \frac{1.05^{-34} ({}_{65}K_{40} - \overset{.05}{K}_{48}) + 1.05^9 \cdot {}_{65}K_{48} - 1.05^6 \cdot {}_{65}K_{40} + 2D_{40}}{.7 (N_{40} - N_{65})} = \$6.06, \\
 & {}^{(+3)+3}G_{35}^{(3)} \\
 & = \frac{1.05^{-34} ({}_{65}K_{43} - \overset{.05}{K}_{48}) + 1.05^{12} \cdot {}_{65}K_{48} - 1.05^9 \cdot {}_{65}K_{43} + 2D_{43}}{.7 (N_{43} - N_{65})} = \$7.51
 \end{aligned}$$

$$\begin{aligned}
 &({}_3+3) + {}_3+3+3 \overset{(3)}{G}_{35} \\
 &= \frac{1.05^{-34} ({}_{65}K_{46}^{.05} - {}_{65}K_{49}^{.05}) + 1.05^{16} \cdot {}_{65}K_{49} - 1.05^{12} \cdot {}_{65}K_{46} + 2D_{46}}{.7 (N_{46} - N_{65})} = \$9.28 ;
 \end{aligned}$$

then

$${}_3+3+3 \overset{(3)}{G}_{35} = \$37.23 + \$6.06 + \$7.51 = \$50.80$$

and

$${}_3+3+3 \overset{(3)}{G}_{35} = \$50.80 + \$9.28 = \$60.08 .$$

These are 102.8% and 105.4% of the respective corresponding new business rates computed above.

These interesting comparisons show that in this particular case the revised rate remains very close to the new rate through one revision, but eventually begins to rise sharply above it, so that it would be questionable whether the company would wish to adopt the practical expedient of using the same rate table for new business as for old business of any considerable age. In the 12 year case, the deficiency of \$3.07 annually has a present value of \$41.95 valued on 1941 CSO 2½%. If the old business represented a relatively small volume, this might not be serious. Another consideration would be whether current new issue benefits were sufficiently comparable to the old business benefits to make the matter more than merely an academic question.

Another very interesting result here is the manner in which the dollar amount of each successive revision begins to rise steeply above the preceding increase. The company might find it advisable to begin projecting for more than 3 years after one or two revisions, whereas competition might make it difficult to incorporate similar longer range projection into the rates for new issues. Obviously, complex problems begin to emerge with the passage of considerable time. A lifetime plan, or a paid-up at age 65 plan, would create an even more serious situation.

Case D. At the risk of belaboring the inflation factor, we consider one final situation. Let us say that initial rates are to hold up for five years. At year $n + 5$, inflation has eased and the company postpones its intended revision of new and renewal premiums. After 10 years, renewed inflation forces the delayed revision. What happens here?

The initial rate, applying to the middle year of the first 5-year period is:

$${}_2 \overset{(3)}{G}_{36} = \frac{1.05^{-33} T_{36} + 1.05^3 \cdot .55 {}_{65}K_{38} + 10D_{36}}{U_{35}} = \$35.39 .$$

At the beginning of the tenth year, revised rates are to take effect. Suppose the 5% inflation level for the tenth year is +7 years, and we project at 5% for another five years. Let us represent the increment on the original 5-year rate as:

$$\begin{aligned} & {}_{+2}^{(+10-3)}G_{35}^{(6)} \\ &= \frac{1.05^{-36}({}_{65}K_{43}^{.05} - {}_{65}K_{43}^{.05}) + 1.05^{12} \cdot {}_{65}K_{48} - 1.05^5 \cdot {}_{65}K_{43} + 2D_{43}}{.7(N_{43} - N_{65})} \\ &= \$15.54, \end{aligned}$$

nearly half the original rate, and the total rate is \$50.93.

The corresponding new issue rate is:

$$\begin{aligned} & {}_{+7}^{(+12-3)}G_{35}^{(3)} = \frac{1.05^{-26}T_{35} + 1.05^{12} \cdot .55 {}_{65}K_{38} + 10D_{35}}{U_{35}} \\ &= \$49.24 . \end{aligned}$$

We have left out of consideration the block of policies issued in the second 5-year period. Assuming they can be dealt with as a group distinct from the first 5-year group (a debatable decision), the increment is:

$$\begin{aligned} & {}_{+7}^{(+10-3)}G_{35}^{(6)} = \frac{1.05^{-31}({}_{65}K_{38}^{.05} - {}_{65}K_{43}^{.05}) + 1.05^{12} \cdot {}_{65}K_{43} - 1.05^5 \cdot {}_{65}K_{38} + 2D_{38}}{.7(N_{38} - N_{65})} \\ &= \$13.82 , \end{aligned}$$

and the revised rate is thus \$49.21, very close to the new issue rate. If the company decides to regard all policies issued over the 10-year period as falling into one classification group, some rate intermediate to \$49.21 and \$50.93 should be adopted.

Since the increment on the first 5-year rate is so large, the company management may feel obliged to anticipate some significant antiselection through lapsation. Let us make the assumption that the best 10% of the risks will lapse, driving up the morbidity of survivors by 5%, for illustration. Ignoring the slight effect on amortization of original first year expenses, we have:

$$\begin{aligned} & {}_{+2}^{(+10-3)}G_{35}^{(6)} \\ &= \frac{1.05[1.05^{-36}({}_{65}K_{43}^{.05} - {}_{65}K_{43}^{.65}) + 1.05^{12} \cdot {}_{65}K_{48}] - 1.05^5 \cdot {}_{65}K_{43} + 2.2D_{43}}{.7(N_{43} - N_{65})} \\ &= \$18.40 , \end{aligned}$$

an amount so great that our company possibly even faces an assessment spiral if it is unwilling or unable to carry this block at a loss. The total

rate, \$53.79, is 109.2% of the corresponding new business rate of \$49.24, and the difference has a present value of \$69.56.

These conclusions suggest several tentative principles.

- a) A company should stay well ahead of developing experience trends, not waiting to effect revisions until experience levels already exceed those allowed for in its rate assumptions, or else the necessary increases may become much too large.
- b) Revision should not be delayed for too many years after issue if there is any real likelihood of eventual need of revision, for the same reason.
- c) A rate table should not be kept in force for new issues beyond the period for which it is intended, unless trends clearly fail to justify any revision at all. Even a modest new issue revision is probably desirable. In this case, the company might well have made a modest revision at the outset of the second 5-year period, even if the initial period rates were not adjusted.

These various examples of inflation projection show how drastically the actual rates vary depending on the original assumptions and policy with regard to forecasting inflation. This is clearly a matter deserving careful attention.

Morbidity Assumptions Too Flat by Advancing Age

This is not an unlikely occurrence under experimental coverages lacking reliable statistics. It might well occur under senior age or lifetime medical coverage, since so little is known of the actual costs. Under high limit, nonscheduled deductible coverage like major medical, understatements may well occur through overestimating the deductible credit or underestimating the value of broadened definitions of eligible expenses.

To provide one quantitative illustration, let us assume that under our hypothetical company's major medical plan, the original assumed scale of claim costs proves to be adequate as far as age 45, but thereafter progressively understates the annual costs. Assume that the value of the understatement may be approximated by the expression

$$Y_x = .2 (1.05^{-46} \cdot {}^{.05}_{65}K_x - {}_{65}K_x), \quad x \geq 45 .$$

The original rate, without any projection for inflation, is

$$\begin{aligned} {}^0G_{35} &= \frac{.6H_{35} + .595H_{36} + .595H_{37} + .55{}_{65}K_{38} + 10D_{35}}{U_{35}} \\ &= \$28.25 . \end{aligned}$$

Now, if the proper scale beyond age 45 becomes known after, say, eight years of experience with the plan, and the adjustment is made at that time, the increment for a policy issued eight years before at age 35 is:

$$({}^{+8})G_{35} = \frac{Y_{45} + 2D_{43}}{.7(N_{43} - N_{65})} = \$4.33$$

and

$${}^{+8}G_{35} = {}^{+0}G_{35} + ({}^{+8})G_{35} = \$32.58 .$$

The revised new business rate is:

$${}^{+0}G'_{35} = {}^{+0}G_{35} + \frac{.55Y_{45}}{U_{35}} = \$30.88 .$$

The 8-year revision is 105.5% of the revised new business rate. The ratio would be still higher if any assumptions as to antiselection through lapsation are introduced. It would also be higher on lifetime coverage or coverage paid-up at a specified age.

Understatement by a Constant Percentage

This error might result from a geographical distribution of business concentrated in high cost areas to a greater extent than expected, or an error in crediting the deductible or in estimating utilization.

Assume the understatement is 10% of the original scale. The increment after eight years, on a policy originally issued at age 35, is:

$$({}^{+8})G_{35} = \frac{.165K_{43} + 2D_{43}}{.7(N_{43} - N_{65})} = \$3.44 .$$

The original rate, as above, is \$28.25, and the adjusted rate thus is \$31.69.

The revised new business rate is also \$31.69. Thus in this case the two happen to be identical, and a single rate table could be used with all years of issue under these particular assumptions (assuming no business to be much older than eight years).

These various illustrations show that revised rates may or may not be close enough to corresponding new issue rates to safely use one table of rates for old and new business. While some average may be struck, a company should know whether the resulting increase in new rates leaves it in a competitive position. There is also the question of the equity of new business thus subsidizing old issues.

Finally, if a combination of several of these factors occurred simultaneously, increasing the disparity, the company might well conclude that major medical is catastrophe insurance to the Insurer as well as for the Insured.

Other Factors

Other factors besides morbidity could influence gross premium experience.

a) *Persistency.* The illustrative assumptions we have been using are not appropriate to an analysis of the situation where actual persistency differs materially from the expected. Such a circumstance will affect the adequacy of the rate being charged in either direction, according to whether the effect on the amortization of first year costs is less than or greater than the effect on the value of eventual benefits to be paid. In our assumptions, no ultimate lapse rate has been incorporated into the computation of gross rates, with the result that the rates are quite conservative with respect to lapsation. We have introduced select lapse rates, which will raise the cost of amortization of excess initial expense, and then followed up with mortality survivorship only in the ultimate period, which places the highest possible present value upon eventual benefits.

A case where persistency assumptions might lead to rate inadequacy would be, by way of example, a situation where ultimate lapse rates were assumed to be 8% of the mortality survivors each year, and actual experience reveals only 5%, say. In this event, eventual benefits have been undervalued in the premium formula, and rates may need to be increased, since it is doubtful that the resulting over-recovery of initial expense would offset the loss on benefits at the higher ages. This is a rather complex situation to analyze from a theoretical viewpoint, especially if the principle of nonrecovery of past losses is accepted. A theoretically precise determination could be made by solving for ${}^+G_x$, the total revised rate, in the following equation:

$${}^+G_x \ddot{s}_{[x]:\bar{t}} + {}^+G_x \dot{a}'_{[x]+t:\overline{65-x-t}} = \frac{10D_{[x]} + {}_{65}K_{[x]} - {}_{65}K_{[x]+t}}{D_{[x]+t}} + \frac{{}_{65}K_{[x]+t}}{D'_{[x]+t}}$$

where the annuities are "gross premium" factors, allowing for the percentage expenses, and all commutation functions are constructed directly upon the two survivorship tables. This treats all past experience as having occurred according to original assumptions, and all future experience as subject to the revised assumptions, thus perhaps pushing the principle of nonrecovery of past loss to the extreme.

Suppose the company had used all of the assumptions of our original illustration, excluding inflation projection, except that select and ultimate lapsation is modified to 30%-15%-8% thereafter of mortality survivors, on the original basis, and 30%-15%-7.5%-5% thereafter of mortality survivors on the revised basis.

Then the following results would have been obtained, employing the above equation for ${}^+G_x$:

- $+^0G_{35} = \$22.69 =$ initial new business rate,
 $+^0G'_{35} = \$24.23 =$ revised new business rate,
 $+^8G_{35} = \$25.45,$ the revised rate for a policy issued at the initial new business rate with revision eight years later.

The latter rate is 105.0% of $+^0G'_{35}$.

- b) *Interest.* While the rate of investment earnings will obviously affect the adequacy of rates, this is certainly no more difficult to forecast under adjustable premium than under guaranteed premium contracts. It should be of far less consequence under term A&S coverages than under life policies, the latter carrying relatively greater reserves. If, in spite of reasonable conservatism in interest assumptions, inadequacies developed, presumably this could be the ground for a revision, though an abnormal one.
- c) *Overhead expense.* Similar considerations apply here. There should be no more reason for inadequacies arising from expenses under adjustable premium than under guaranteed premium coverage, except for such a factor as claim administration, referred to earlier in illustrating the effect of "deductible erosion." It should be pointed out, however, that our illustrative examples have allowed for some increased expense after revision automatically, since renewal noncommission expense was covered by a loading of 15% of renewal premium. Some companies have written a provision into agents' contracts limiting the commission dollars to the commission on the original premium. In such a case, the revision increment will be lessened, possibly so much that the revised rate could even be lower than the corresponding current new business rate. Our illustrative assumptions have implied that the 15% renewal commission is paid on the entire revised rate.

IV. CLASSIFICATION

Any discussion of adjustment of rates would be incomplete without consideration of several questions involved in risk classification. Questions of rating classification or reclassification are inseparably related to the whole problem of rate revision.

What is a class? This is such an obvious concept, superficially, that it would seem to require little analysis. A little reflection, however, will reveal that some difficult questions are involved with regard to adjustment of premiums.

Since we are dealing with a contract in which the sole unilateral right retained by the Insurer is one of changing the premium, it is clear that what concerns us is class viewed in relation to premium. The idea of class may be approached in several ways, as becomes clear when the attempt

is made to construct definitions of it. For example, we might define class in terms of homogeneity of group, thus:

- a) Class is that combination of attributes of a risk that are sufficient to differentiate it from all other risks not so similar as to be subject to essentially the same hazard of loss.

Many attributes may be involved, including, in addition to age, sex and occupation: geographical area, underwriting rules under which accepted, physical condition, and even manner of solicitation (clearly an underwriting factor). The same risk might fall into any number of different classes, according to the circumstances. We are not directly concerned with this definition of class, although it will lie behind the definition that is relevant to our purpose. As a definition relevant to premium, let us define class thus:

- b) Class is that combination of attributes of a risk, which, at any given time, are sufficient to determine the premium to be charged for the risk.

This definition is a practical adaptation of the first, in which we consider only those attributes which in actual practice are taken into account in rate classification. For various practical reasons, a company will choose to disregard certain attributes which might be very relevant under the first, more theoretical, definition. Criticism of this second definition might be raised on the ground that it leaves an opening for discrimination. Such is not the case. It may be taken for granted that we are speaking of legitimate attributes, and, if so, the definition precludes discrimination, since it calls for equal rates for equal risks.

The inference to be drawn from this definition is that all risks insured for the same benefits and paying the same premium belong, per se, to the same class. An Insurer may not wish to go this far. For example, a company might charge initially the same rate for two different geographical areas, but want to reserve the right to rate them differently later if experience warrants. It would seem that in such a case a company should specifically include area in the rating classification at issue, so as to leave room for this. In the absence of such supplementary definition, rating class may be fairly inferred from the rate structure, and if age and sex are sufficient to determine the rate, then class is comprised of age and sex.

This view may be considered objectionable on the ground that, under experimental underwriting, relevant attributes may not always be recognized at time of issue. Certainly the approach to class definition should not be so restrictive as to endanger the future successful administration of renewal business. However, if we depart too far from a point of view essentially similar to definition (b), class becomes such an elusive thing,

affected by so many latent factors, that it is questionable whether the right of the Insured to retain his original classification has much meaning. A policy provision referring to original classification implies that such classification is ascertainable. If a company feels obliged to retain more latitude, it probably should not guarantee original classification entirely, but should use instead a partial guarantee such as is embodied in the language of Clause 2 on page 478.

Let us now consider several specific questions relating to rate revision.

1. *Is reclassification ever justified?*

Under certain circumstances, reclassification is certainly called for. An example is occupational reclassification under time loss policies. Under guaranteed premium time loss contracts, many insurers restrict this to reclassification of women upon cessation of active employment. Another example would be change of residence, where area classification is used, as might be the case under a major medical contract. If the company wants to retain the right to reclassify in these instances, it should obviously use policy language so permitting, as mentioned above.

2. *Is subdivision of class at time of renewal revision an instance of reclassification?*

Certainly, if we adopt the viewpoint toward class stated above. Otherwise, we have readmitted the right of the Insurer to take later recognition of latent factors. Subsequent subdivision by geographical areas is an obvious example. Another interesting case arises when the rates are originally classed by age groups, such as in 10-year age groupings. If the Insurer later wished to classify by annual ages, reclassification would be involved. This should be clear by looking at the matter from the viewpoint of the Insured at time of issue. If the same rate is charged, say, at ages 30 to 39, a 39 year old applicant is being given a rate under which his risk is averaged against younger lives. If his issue age is separated out later, this would seem to violate his right to his original age group classification.

3. *Is time of issue a factor of class, and is duration a legitimate factor affecting rate revision?*

Our definition specifically refers to time of issue. Underwriting practice changes, as well as other factors. Time of issue is clearly a potential factor. However, some practical means is desirable for setting boundaries to classes according to period of issue. A change in new issue rates could be regarded as a practical dividing point, and this would be consistent with our definition. Clause 5 (page 479) uses policy form replacement for the purpose. It is difficult to say whether either or both

of these would always be a practical and sufficient device, particularly if they are not needed in their own right at any given time.

In Case D of our inflation illustrations, duration alone is employed for setting breaking points between the blocks of business issued in the first and second 5-year intervals. The same initial rate was in effect throughout the 10-year period. Under our definition, it would seem that policies issued throughout the 10-year period fall into the same class, however. In the illustration on page 488, we considered the increment applying to a policy eight years old. Theoretically, different increments would arise for each in-force duration at the time of revision, although it is doubtful whether in practice any Insurer would actually want or need to charge different increments for every year of duration.

It would not appear that duration alone can be regarded as a factor in class, in the absence of some other distinguishing break such as a change in rate tables or policy forms. Accordingly, if an Insurer wishes to retain the right to distinguish duration groups, it should probably include appropriate language in the policy provision itself. The illustrations in Section III suggest that it is probably desirable to do this as a matter of caution, and this is, of course, consistent with interpretation (i) of the original age basis, stated on page 476, where duration is automatically a factor in the computation of an adjustment increment.

4. *Does loading for antiselection through lapsation amount to reclassification?*

It would not seem that this is a fair conclusion. While it is true that lapsation of the better risks results in a worsening of the average surviving risk, the Insurer's right is to charge a rate commensurate with the expected experience of the survivors in the class, whatever that may be. The illustrations have shown, however, that the Insurer is well advised to administer the business as carefully as possible to minimize the dangerous effects of such lapsation.

V. MISCELLANEOUS CONSIDERATIONS

Valuation of Revised Blocks. Theoretically, each block, which, through revision, becomes subject to a distinct rate, might be regarded as a distinct group for valuation of active life reserves. Except in extreme circumstances, this is probably unnecessary and also impractical, although, if reserve strengthening becomes definitely necessary, the company would have to decide between an abrupt strengthening and a more gradual shift to a stronger basis. The latter could amount to valuing each block as a distinct valuation group.

Ratebook Revision. In many instances, a company may wish to revise its ratebook without either adjusting in-force premiums or superseding its policy forms. Examples, again, are subdivision of age group or geographical rating classes. Other instances might be increasing or lowering rates, not accompanied by any need to trouble the in-force business. Accordingly, a company should construct the premium adjustment clause with care so as not to jeopardize freedom of action unduly. As has already been mentioned, Clause 5 on page 479 creates severe limitations, preventing such a ratebook revision without also superseding the form series. Such a restriction does not ordinarily operate with respect to guaranteed premium forms, and there seems to be little reason why a company should tie itself down under adjustable premium forms. Form revision may involve considerable expense. Furthermore, in filing forms, there will often be delays and negotiations with various insurance departments on the approval of certain items. Consequently, it would appear cumbersome to tie rate classification and revision too closely to policy form as such.

Recent Issues. When a rate revision has to be made, there will have been some policies issued so recently as to make it a matter of poor policyholder relations to revise the rate immediately. A policyholder is apt to have second thoughts about staying insured with a company that issues him a policy for an initial quarterly premium and then raises the second quarterly premium. This is another reason for a company to avoid the situation where it *has* to revise in-force premiums if it revises its ratebook, as would again be the case under Clause 5 if rates are changed on a form continued current. This is also a practical reason for retaining some freedom to deal with rates by duration, even within an issue period rating class. If a company has issued policies on one table for, say, five years, and then finds it necessary to revise rates, it might be well to defer the increase on business less than, say, two years old, and effect the increase at the second anniversary of such policies.

Participating versus Nonparticipating Business. Some of the problems that have been raised are of greater moment under nonparticipating than under participating contracts.

- a) Loading margins. Since participating rates ordinarily contain larger margins, it may be assumed that rate deficiencies will be longer in appearing, with required revisions of possibly smaller magnitude.
- b) Equity through dividends. We have raised the question of equity between two blocks of different age where the same rates are charged but a significant variation exists in the "theoretical" rate applying to each. So long as the actual rate is at least sufficient to carry each block, any relative inequity in gross rates on a participating basis may be adjusted in dividends, assuming the distribution formula itself to be equi-

table. Under nonparticipating rates, however, equity must be achieved in the actual gross premium charged.

VI. CONCLUDING PRINCIPLES

In summary, we may state the following as reasonable principles governing the administration of the premium adjustment clause.

1. *Rights of the Insurer*

The Insurer should have the right to charge a rate sufficient to cover expected future loss, and to allow for reasonable contingency and profit margin. This includes a right of reasonable anticipation of developing loss, and of charging a sufficient price to finance an increase in prospective reserves.

2. *Rights of the Insured*

a) The Insured should have the right to preservation of his original classification, except to such extent as the Insurer may specifically reserve a limited right of reclassification. Such right of the Insurer should not extend to reclassification solely for change of health or individual claim history.

b) The Insured should have the right to preservation of the level premium equity accumulated under earlier premium payments, thus precluding age reclassification.

c) The Insured should have the right to the financial possibility of renewal.

d) The Insured should have the right to an initial rate contemplated as level in terms of then current experience.

3. *Administrative Principles*

a) Careful analysis of possible future circumstances should precede the establishment of an original table of rates and the setting of tentative policy with respect to the effective period of a rate table and the degree of projected adequacy in rate revisions.

b) Revision of rates should ordinarily be made promptly when trends indicate developing rate deficiencies, and require greater care the longer the interval of time after issue.

c) A practical measure of latitude should be retained with respect to the administration of in-force blocks of varying duration.

d) Adjustment of premium provisions should be carefully constructed in harmony with the Insurer's desired latitude of administration with respect to varying duration, reclassification, rate revision under a continuing form and other factors.

4. *Form of the Premium Adjustment Clause*

Finally, then, what type of contract language would seem to maintain these several principles? There will be some variations according to the

functions the clause is intended to perform. If too extreme a variation exists, however, the adjustable premium type of contract will cease to be a well-defined generic form, and the public will never know what to expect from the term "guaranteed renewable."

From the foregoing considerations, it would appear that at least two types of clause have a legitimate place.

a) Without reservation for limited reclassification.

One possible wording for this type would be:

The Company reserves the right to change at any time, and from time to time, the table of rates applicable to premiums thereafter becoming due under this policy. If the applicable table of rates is changed, the original classification and insuring age of the Insured shall be used in determining the premium from the new table of rates, and the same premium shall apply to all other policies of like benefits and provisions and of the same classification and duration.

This language gives full protection to the Insured, while still allowing maximum latitude of administrative action to the Insurer. It specifically allows duration groupings under the original age basis. It should be emphasized that this does not *require* the Insurer to vary the table by duration. It merely states that all policies of like duration shall have corresponding rates. The number of duration groups may be one only, or several.

b) With reservation for limited reclassification.

One possible wording would be:

The amount of each renewal premium shall be determined from the Company's applicable table of rates in effect on the due date thereof, according to the classification of the Insured in effect on the due date thereof. The Company reserves the right to change at any time, and from time to time, the table of rates applicable to premiums thereafter becoming due, and to change at any time, and from time to time, the classification of the Insured. However, no change may be made in the classification of the Insured as to insuring age, nor solely on account of a change in physical condition or of claims incurred under this policy, nor shall the Company have the right to attach any restrictive rider to this policy applying to coverage already in force. The premium applicable to this policy on any due date shall also apply to all other policies of like benefits and provisions and of the same duration, and of the same history with regard to classification.

This clause permits considerable latitude of reclassification, even to the establishment of entirely new classes not originally in use. An alternate wording, limiting the Insurer to reclassification only among original established classes, would be:

The amount of each renewal premium shall be determined from the Company's applicable table of rates in effect on the due date thereof, accord-

ing to the classification of the Insured on the due date thereof. The Company reserves the right to change at any time, and from time to time, the table of rates applicable to premiums thereafter becoming due. If at any time the classification in effect for the Insured ceases to apply because of a change in the classification status of the Insured, the classification of the Insured shall be changed to the applicable class, effective with the due date next following such change of status. However, no change may be made in the classification of the Insured as to insuring age, nor solely on account of a change in physical condition, or of claims incurred under this policy, nor shall the Company have the right to attach any restrictive rider to this policy applying to coverage already in force. The premium applicable to this policy on any due date shall also apply to all other policies of like benefits and provisions and of the same duration, and of the same history with regard to classification.

One or the other of these two general types of clauses would seem to be adequate to handle any of the principles and problems which we have discussed, while adequately maintaining the respective rights of Insurer and Insured.

APPENDIX

Values of ${}^{.05}H_x$ and ${}^{.05}K_x$, based on Walker's costs for male lives, Major Medical benefit with \$25 daily room limit, \$500 deductible, and \$7,500 maximum benefit.

Age	${}^{.05}H_x$	${}^{.05}K_x$	Age	${}^{.05}H_x$	${}^{.05}K_x$
25	13,047	1,886,293	46	40,415	1,422,901
26	13,654	1,873,246	47	43,330	1,382,486
27	14,245	1,859,592	48	46,262	1,339,156
28	14,906	1,845,347	49	49,412	1,292,894
29	15,587	1,830,441	50	52,539	1,243,482
30	16,287	1,814,854	51	55,766	1,190,943
31	16,969	1,798,567	52	59,052	1,135,177
32	17,766	1,781,598	53	62,415	1,076,125
33	18,566	1,763,832	54	65,812	1,013,710
34	19,365	1,745,266	55	69,196	947,898
35	20,248	1,725,901	56	72,994	878,702
36	21,173	1,705,653	57	77,583	805,708
37	22,271	1,684,480	58	82,937	728,125
38	23,551	1,662,209	59	88,938	645,188
39	24,998	1,638,658	60	95,652	556,250
40	26,594	1,613,660	61	102,986	460,598
41	28,439	1,587,066	62	110,807	357,612
42	30,422	1,558,627	63	119,130	246,805
43	32,619	1,528,205	64	127,675	127,675
44	35,035	1,495,586			
45	37,650	1,460,551			

DISCUSSION OF PRECEDING PAPER

WALTER SHUR:

Mr. Barnhart has written a very interesting paper in which he sets forth his views as to the actuarial principles which should underlie equitable administration of the adjustable premium contract. The most important of these relate to recovery of past losses, classification of policyholders for purpose of rate revision, and preservation of level premium equity. The purpose of this discussion is to take strong exception to the author's views on these matters, such exception being based on the conflict of these views with the fundamental principles of mutual insurance.

Briefly, the purpose of mutual insurance is to provide insurance at actual cost, subject, of course, to the guaranteed maximum represented by the premiums charged. The premiums are set at conservative levels and include margins for possible future contingencies. It is the existence of these margins, and the year-by-year adjustment of future dividends, which enable the mutual company to provide insurance at actual cost. Of course, the "actual cost" for a particular policyholder is not an amount which can be determined in a vacuum, but depends entirely on the dividend class in which the particular policyholder is placed. Every effort is made to make such classes as homogeneous as possible, with respect to both past experience and current experience, subject to the practical limitations imposed by administrative complexity and by the principles of statistical averaging. It is a well established fact that dividend classes can reflect past experience, that dividends may be adjusted to reflect past losses and, furthermore, that dividend classes may be determined by the Company in any manner necessary to ensure equity of cost among the various policyholders. Justice Lehman, J., in delivering the majority opinion in the *Rhine* case, notes the following with respect to the insurer's method of determining dividend classes: "It divides these into a great number of classes or groups—we are told approximately 150,000—based upon variation in some factor which entered into the computation of the anticipated costs of furnishing the insurance when the premium is fixed or into the computation of the actual realized cost when the divisible surplus is apportioned. . . ." Thus, the mutual insurance concept involves

- (1) *the determination of class* as is necessary to realize equity of cost,
- (2) *the guarantee* as to maximum cost, and
- (3) *the adjustment of dividends* as the means of providing insurance at actual cost.

The foregoing concepts, with one exception, are in a mutual company as applicable to the adjustable premium contract as to any other contract—the exception, of course, being elimination of the guarantee as to maximum cost. As Mr. Barnhart has stated, “the kind of situation that calls for an adjustable premium contract is one where the future hazard is abnormally unpredictable, either because it is known or suspected to be prone to wide fluctuations on account of various uncertain influences, or else because the hazard has been insufficiently measured, the statistics being too scanty or too immature.” The mutual insurer, while still adhering to the principle of insurance at actual cost, finds that in such a situation the inclusion of sufficiently conservative margins would produce a totally unrealistic premium. The solution is to issue an adjustable premium contract, having in mind that future adjustments of premiums will serve precisely the same function as future adjustment of dividends, namely the realization of insurance at actual cost.

Two important principles, both directly contrary to Mr. Barnhart’s views, follow from what has been said, namely:

- (1) For the purpose of rate revision, and in the absence of specific restrictions in the renewal clause, class may be determined by the mutual insurer according to the usual methods used for dividend purposes (*e.g.*, classification by issue age and duration).
- (2) Premium adjustments, just as in the case of dividend adjustments, can reflect past experience as well as future anticipated experience.

The basic argument used by Mr. Barnhart in support of his views against the recovery of past losses is the “preservation of level premium equity.” The concept of preserving equity under an adjustable premium contract deserves a much closer examination.

Of prime importance is the matter of the level premium itself. Here, there can be no disagreement with Mr. Barnhart’s contention that the initial or revised rate must be adequate (in a level premium sense) in terms of current experience. This principle is merely a restatement of something that has always been a fundamental responsibility of the actuary in mutual insurance, namely that illustrative dividends be truly representative of current levels. The fact that, in an adjustable premium contract, premiums as well as dividends may be adjusted, does not lessen or increase that responsibility one iota.

The level premium feature of the adjustable premium contract is simply a device through which the insured can budget a level amount for an insurance benefit which is known to increase with advancing age. This budget is, of course, based on certain assumptions as to future experience.

To the extent that actual experience develops differently from anticipated experience, the budget must from time to time be revised. This is the essence of rate revision on an adjustable premium contract. Of course, the revised budget should also take into account any existing funds resulting from the excess of past income over past disbursements. If this is done, there can be no question but that policyholder equity has been preserved.

In summary, then, the basic principles underlying the adjustable premium contract issued by a mutual insurer, in the absence of specific guarantees as to cost or classification, are the following:

- (1) There are no implied guarantees of any kind as to the eventual cost of insurance.
- (2) Classification for rate revision may be determined according to the same principles that have been well established for the determination of dividend classes.
- (3) Rate revisions can be viewed in the same light as dividend adjustments, and can serve exactly the same purposes. Alternatively, rate revisions can be considered simply as budgetary revisions occasioned by departure of actual experience from anticipated experience.
- (4) The calculation of revised rates should take into account any existing funds resulting from the excess of past income over past disbursements.

EDUARD H. MINOR:

Mr. Barnhart's paper presents a detailed analysis of a number of situations that may possibly be encountered in the future development of guaranteed renewable business. The clarity and precision of his exposition is admirable, but it has been made so through focusing attention on more or less hypothetical situations. Unfortunately, the paradoxes of actual experience defy attempts at neat classification and tend to frustrate the health insurance actuary.

If we examine the history of noncancelable accident and health insurance, we find that there were frequently no warning signals apparent to anyone as the experience unfolded through critical points. Prior to 1930, when I first became acquainted with this line of business, there were indications that the actuarial assumptions were well founded and the future was anticipated as confidently as in the case of the *Andrea Doria*. Antiselection, involving abuse of the short waiting periods, was thought to be a temporary phenomenon. As time went along, our patient view was disturbed by the steady lapse of healthy lives and a trend toward early retirement of older lives unable to cope with depression difficulties. The situation gradually became too complicated to permit any precise

evaluation of the current experience and hence no clear-cut decisions could be made as to the future, even if the insurer had had the right to revise premiums as in the case of modern guaranteed renewable business.

In this actual situation, not covered by Mr. Barnhart's paper, or a similar future one, solvency might be threatened if rates on existing policies could not be revised to provide the reserves required on a retrospective gross premium valuation. When this occurred in the past, in at least one instance, it was necessary to set up liens against the benefit provisions of the policies responsible for both the past and expected future losses. It cannot be assumed that an insurer would be at fault in waiting a reasonable time for the experience to mature sufficiently so that temporary fluctuations could be clearly distinguished. The parallel history of the total and permanent disability provision in life insurance policies provides us with actual experience and court decisions which support this view. It must be kept in mind that these two lines of business differed only in the length of the waiting period required before benefit payments began. Both were beset by difficulties as similar as is likely to be found in actual practice, except that in the case of total and permanent disability business written by participating companies it was possible to reflect the greatly increased cost of these benefits through negative dividend adjustments.

As to discretion in making such negative dividend adjustments, it was clearly stated in *Rhine v. New York Life Insurance Co.* (248 App. Div. 120 [137]) that "from 1920 to 1930 the defendant, acting under the belief that the disability experience was approximately equal to that which had been assumed in the calculation of the premiums and that any adverse experience was a mere accidental temporary variation due to chance, to be taken care of by the company's contingency fund, employed what is referred to as a zero factor as to disability policies. From 1931 to 1935, as the result of its experience the defendant, instead of using a zero factor, employed a negative factor on its disability policies. . . ." There is further corroboration as to the leeway which courts recognized as necessary in such situations, e.g., in *Barnett v. Metropolitan Life Insurance Co.* (258 App. Div. 241, [243]) the court said "The Company, in 1918, began to issue ordinary life policies containing . . . disability benefits . . . the company adopted and used certain conservative and well-known tables. At first the tables proved to be accurate. Later, however, fluctuations in disability claims showed losses in specific years. *Despite the fluctuations* the company decided and did use a zero factor in calculating dividends to be paid *until such time as its long range experience in this field* of insurance should give the company more accurate information. . . ." A number of years passed before negative dividend adjustments were introduced but the

court approved the wisdom of delaying decision under the circumstances.

As to the latitude permitted an insurer with respect to the nature and manner of cost adjustment through dividends, the legal decisions are quite clear. In *Rhine v. New York Life* (supra), it is stated that, to succeed, the plaintiff "must show that the principle on which the apportionment is based is so clearly erroneous as to be beyond the exercise of any reasonable discretion on the part of the company's directors." Similar statements were made in *Uhlman v. New York Life*, *Greef v. Equitable*, and *Equitable v. Brown*.

Mr. Barnhart raises many questions with respect to the proper definition of "class." He suggests that all risks insured for the same benefits and paying the same premium belong, per se, to the same class. In *Rhine v. New York Life* [126] it is stated that ". . . every mutual life insurance company divides its policies into a *large number* of homogeneous classes. In a 'class' consisting of similar policies *issued at the same time*, under the same conditions, at the same age, with the same dividend distribution period, upon the same plan of insurance and calling for the same annual premium . . . there is not, even in the largest companies, a sufficient number of persons to give a true average rate of mortality."

This court decision indicated clearly that time of issue is a necessary factor in determining "class." In hospital or medical expense insurance, the date of issue could be more of a determining factor than in life insurance. Coverage on children for polio expenses, written before the discovery of the Salk vaccine, might show significant loss as compared with policies written thereafter. Similarly, in the event of the development of a very expensive and lengthy cure for cancer, it might be several years before the experience would indicate the extra premium to be charged. Policies written subsequent to a severe epidemic would have a widely different experience from previous issues.

The question raised as to the justification for reclassification is not fully explored in the light of the practical considerations peculiar to this type of insurance. For instance, it is necessary to contemplate changes in the status of the insured which will automatically create new classes. Couples may buy a family policy when they have no children; five years later they may be in a class that has incurred a substantial loss—not only because of the maternity claims, but because of adverse experience with young children. Although contemplating, a priori, different family classes, the insurer is unable to distinguish, at the time of issue, the couples that will not have children from those that will. Nor can the losses be assessed to persisting policies in proportion to the future risk of maternity (which will have greatly dwindled).

Another example will illustrate the difficulty of attempting too rigid definitions of a class: the Canadian policies which were stripped of the basic hospital coverage before being in force long enough to overcome their initial deficits. Surely it was no fault or miscalculation of the insurer that brought about such losses and it would seem reasonable to leave it to the insurer's discretion as to how such losses should be equitably assessed.

There are a great many odd situations that may arise which would require a practical rather than a theoretical approach in defining a "class" as well as in appraising the broad equities involved in revising premium rates. Mr. Barnhart's paper makes a start in this direction but past experience with noncancelable A & H and total and permanent disability casts doubt on the possibility of developing satisfactory solutions on an *a priori* basis.

E. L. BARTLESON:

Mr. Barnhart has filled a great need by presenting this paper on the principles and problems of guaranteed renewable policies under which the insurer retains the right to change the premiums. Whatever may be the best form of guarantees and whatever may be the best way of making original and revised premium rates for policies of this general class, it is very helpful to examine critically the possible alternatives.

So far as I know, the first such policies were those issued in 1952 by the Prudential. I believe the evolution of our guarantees may be of interest. In our earliest policy form, the only promises were (a) the guarantee of renewal to a stated age without alteration of the benefits and (b) that the premium on any renewal date would be determined from the applicable table of rates then in effect, but according to the original insuring age.

While our thinking was not entirely consolidated at that time as to what we *should* do on any change of rates, there was general agreement on several points:

- (1) That the premium rate applicable to any particular policy would not be varied because of the claim experience of that policy or because of any change in the physical condition of the people insured thereunder.
- (2) That we had retained the right to subdivide the rates according to classifications not contained in our original filing and to apply these either according to the risk as originally written or according to the risk as constituted on the renewal date. (The possibility of change of classification was not involved as we classified only by age and sex.)
- (3) That we had not precluded subdividing the rates according to year of issue.

The Insurance Departments of several states objected to our apparently unrestricted right to change the rates. We assured them that we had no intention of taking into account the individual's claim experience or change in physical condition, and on our first revision in 1954 we included these guarantees in our policy (item (1) above).

When we made our next filing in 1956, several Insurance Departments took the position that the open right to subdivide the classes and to reclassify the individual could potentially defeat the promise of not taking into account the individual experience or physical condition. The sort of example given was that in a sufficiently small geographic area we might very well have only one person in a particular occupation insured at a given age in a given year so that sufficiently fine classifications could put many of the risks in classes by themselves. We knew, of course, that we would never attempt such a thing but decided that in order not only to remove these objections but also to provide a really meaningful guarantee we would promise that the premium rates would always be according to the original classification. I am not prepared to go so far as Mr. Barnhart who states that separating an age group into individual ages violates an insured's right to his original age group classification, but I do agree that introducing a new classification factor such as geographical area not differentiated in the original rates would violate the guarantee of original classification. While practical considerations require in this business, as in the life business, that we reduce ratings on individuals whose insurability status improves substantially, it does not appear important financially to reserve the right to increase the ratings of those whose position worsens. Having necessarily agreed not to reclassify for the reason most affecting claim rates, deterioration in physical condition, it seems good business to promise not to reclassify for any reason. Likewise, to subdivide the original classes for factors not originally thought sufficiently significant seems to me to be changing the rules in the middle of the game. The remaining question, which has not yet been resolved, is the propriety of subdividing the rate table according to year of issue. In participating insurance, we regularly grade dividends by duration so that it might seem proper to grade renewal premium rates by year of issue. This is not the same thing, however. Where we have several years of issue of life insurance with the same premium rates and on the same forms, we do not keep them in separate compartments: the dividend at, say, duration 10 may be larger than at duration 9, but unless the scale is changed, the later policy will move up a year later to the higher dividend. If an insurer moves promptly to change premium rates when it is seen that the previous rates are improper due either to inadequate knowledge or changing conditions, it is

not necessary to vary the rates by year of issue. Mr. Barnhart states that there is "no basis whatever in actuarial logic" for making the revised rate the same for all years of issue as the new issue rate. There is a very simple answer to this: if we define the loss which is not to be recaptured to include not only the variation in experience to date from that originally expected, but also the difference in the "fund position" of such policies from that expected at such duration on the revised rates, then the calculations proceed with perfect "actuarial logic"—but the margin in the rates must contemplate this additional potential loss. It is a reasonably straightforward thing to promise an individual that his rate will not be increased above that the company may find it advisable to charge a new entrant at his original age and original classification. But he is a "captive" by increase in age if not also by deterioration in insurability and to retain the right to charge him more than a new risk in order to restore all margins makes his guarantees worse than for yearly renewable term insurance at attained age premiums so long as he remains insurable. It does not seem to me that such additional reservation of right on the part of the insurer is necessary or desirable. We regard the right to change rates as a protection against substantial loss, not one to remove it completely.

ROBERT P. COATES:

Mr. Barnhart is to be commended for his paper discussing principles which should be applied in dealing with premium adjustments under guaranteed renewable accident and sickness policies. I was particularly impressed by his demonstration of the revised premiums which might be appropriate to preserve equity under varying conditions. These demonstrations make it abundantly clear that the rate currently applicable to new issues at the original issue age is likely not to be appropriate as a revised rate for outstanding policies. It is to be hoped that this point will be fully recognized by insurance departments and others dealing with this form of coverage.

Mr. Barnhart further points out that a company should stay well ahead of developing experience trends. In this way rate adjustments are more likely to be kept to a reasonable amount and the antiselection that may develop with large rate increases can be minimized.

Mr. Barnhart suggests that rate revisions should not be applied to cover past losses. I question whether this should be regarded as a rigid principle, particularly in mutual companies. For example, if a company had put off a rate adjustment for a period in the hope that adverse experience was merely a statistical fluctuation, it would seem more appropriate to include provision for losses of that period in the revised rates

than to regard them as a charge against some broader class of policyholders. Of course, it would hardly be appropriate to assess losses of the more distant past against the policies of a particular policy series which are still in force.

I found Mr. Barnhart's discussion of classification somewhat difficult to follow, perhaps because classification can be such an elusive matter. I am inclined to feel that the basic principle should be that individuals be treated on a class rather than an individual basis and not subject to individual underwriting action at the time of the rate change. Thus, I doubt that there should be objection to introducing a subdivision of the rating classifications when such action is called for by the facts. I am inclined to feel that types of reclassification which are nondiscriminatory should be permitted without requiring the rather complicated policy clauses suggested in section 6 of Mr. Barnhart's paper.

I feel that this paper is particularly helpful at this time in view of the large and increasing interest in guaranteed renewable forms of coverage. Mr. Barnhart is to be congratulated on the contribution he has made.

WARD VAN B. HART:

It is very helpful to have in print an initial summing-up of the problems of premium adjustments under guaranteed renewable insurance, with valuable suggested typical solutions. Although this product is a "unique instrument," like all other human institutions it evolved from its predecessor products, and some of its problems have already existed under cancelable insurance. This was particularly true in the occasional setup where accident and health insurance was issued on a level premium rather than a step-rate basis or where the right to cancel was limited, for instance, to reasons other than changes in physical condition of the insured or, more broadly, where by deliberate intent a management policy was adopted under which cancellations were held to a bare minimum. Where any or all of these conditions have existed, companies have had to cope already, even if only on a restricted scale, with the problems described in the paper.

Although I can detect in the paper (and in the statement by Mr. Howell quoted by the author) a consciousness of the importance of maintaining high standards to protect the *insured* as well as the company, history does not seem to reveal the need for overmuch anxiety on this score. I do not recall any mad rush by the companies in the cancelable days to impose excessive rate increases on existing business, when rates proved inadequate. In the 1930's the company with which I was connected did increase some rates, but only with considerable reluctance, and with a

watchful eye on what other companies were doing. At times, rates were increased for new business but the renewals were left undisturbed. Rather than having hit upon the valuable principle laid down by Mr. Barnhart that rates should preferably be increased in *anticipation* of loss rather than waiting for the loss to materialize, the companies seem to have demonstrated a considerable time lag as the prevailing pattern.

I mention some of this history with full realization that much of it relates to *accident* insurance, that family hospital and major medical insurance were then almost unknown, and that, nostalgically speaking, life used to be much simpler. Unless, however, the human element governing company decisions has changed radically, our chief dangers may lie in the lack of prompt courage in taking necessary action.

Needless to say, the value of this paper is not limited to carriers issuing guaranteed renewable insurance. Companies issuing cancelable insurance may study with profit at least certain parts of Mr. Barnhart's technique.

There is an allied problem implied in the paper, which I am sure we would be overoptimistic to brush aside. What do we do if a certain coverage, or perhaps some isolated feature of the coverage, becomes uninsurable, in the opinion of the company, at any price? It would seem that at least a partial "freeze-out," to which Mr. Barnhart properly objects when used as a subterfuge, may sometimes be both inevitable and justifiable. All of us in our student days, when studying the question of friendly society reorganizations, insolvent companies, assessment insurance, etc., were indoctrinated with the concept that "a reduction in benefits is preferable to an increase in premiums." In group insurance we employ the concept with considerable success when a situation has got out of hand. Is there anything unethical about an attempt to reconstruct a policy with sounder benefits, of course with written amendment by the insured, using a token increase in rates merely as a means, even though it may be a partial "freeze-out"?

A review of the noncancelable loss-of-time coverage with indemnity payable for life, with which some of us struggled during the '20's, might be instructive. If it had been issued as guaranteed renewable, would we, by increasing premiums, have been able to arrest the tremendous losses which were incurred, or would we have created the "assessment spiral," of which Mr. Barnhart is evidently conscious?

In 1941, in discussing Mr. Jarvis Farley's paper on "Non-Cancellable Insurance" (*PCAS XXVII*, 345), I expressed, perhaps not too seriously, a regret that we had not had the foresight in 1920 to incorporate into our noncancelable contract a policy provision allowing us to drop the entire line of insurance on a basis precluding individual selection. I drew the

analogy with the group insurance attack, and while my facetious remedy may have been too drastic, I was evidently even then groping for a protection to the company approximating what has finally emerged as guaranteed renewable insurance. Incidentally, the group retrospective rating philosophy may shed some light on our problem, as any reasonably homogeneous block of guaranteed renewable insurance may be regarded as a quasi-group. I do not mean that we can follow group techniques blindly in our rate adjustments, but a comparison of the problems involved may help us to orient ourselves on such matters as assigning credibility to a particular block of business which because of accidental fluctuations exhibits either unduly favorable or unduly unfavorable results.

Since the time when the life indemnity benefit was abandoned, the loss-of-time benefit with a five or ten year limit, or with a limit at attained age 65, has proved quite successful. Granted that favorable employment conditions have contributed to this success, it definitely seems that the life indemnity benefit was uninsurable at any price. An intensive campaign to rewrite that early business with the life indemnity provision replaced by some reasonable limit could have been offered in lieu of a rate increase if it had been originally issued on a guaranteed renewable basis, and such an action probably would have been in the interest of the public. It would not be worth while laboring this point, were it not for the fact that we may face an analogous problem some day in major medical or some other coverage.

On an entirely different subject, there is one point in the paper which should not pass unnoticed. Under Section II, Clause 5, the author suggests that under certain conditions it might be advisable to "require such an Insurer to demonstrate that its revised rates are actuarially consistent. . . ." On the matter of distributing surplus, the courts have consistently denied petitions by a policyholder requesting an accounting of dividend calculations, and have, in effect, said that a company may, within broad limits, distribute surplus as it sees fit. There are certain clear parallels between distribution of dividends and imposition of rate increases, and if we admit a requirement which puts the burden of proof of correctness on the company in the latter case, we may well be heading into a very anomalous position, particularly on participating guaranteed renewable policies.

CHARLES N. WALKER:

The discussion thus far has had considerable mention of duration and the propriety of its use in adjusting premiums on policies of the type

under discussion. One further comment may be in order. In the actuarial examples shown in the paper, Mr. Barnhart has used premium formulas of the Cammack type in which the high first year expense is amortized over the life of the policy. Different premium formulas may present different problems. This is particularly true when the original gross premium uses a formula which demands that first year expenses be amortized at the end of a definite period, such as 10 years, and that a definite tabular reserve be accumulated at the end of the same period. In adjusting a premium originally calculated under these limitations it would seem to be necessary for the protection of the company to retain this period of 10 years (to continue the same example) from the original issue date for amortization of the first year expense.

It is also necessary to accumulate the revised tabular reserve (which may be higher or lower than the old). This may be done over the original 10 year period, or over some longer period. In either event the amortization of the first year expense over a fixed calendar period from original issue and the accumulation from the tabular reserve on the adjustment date to a specified new tabular reserve at the end of a fixed calendar period (whether from issue date or adjustment date) will result in different adjusted gross premiums for each different year of original issue, *i.e.*, gross premiums in which duration is a mandatory variable except to the extent practicality and convenience will permit grouping of several years of original issues together.

JOHN H. MILLER:

One of the speakers mentioned the anomaly of a participating guaranteed renewable policy and I think this was also indicated by some of the remarks that the first two speakers made, which seemed to leave a little doubt as to where dividend distribution leaves off and premium adjustment begins.

It would seem to me very unfortunate if there should emerge a pattern or a rule relating to premium adjustments which was based upon participating policies only and was inapplicable to nonparticipating policies. This would call for a different set of ground rules for the latter.

Possibly one way of resolving this anomaly would be to consider, as Mr. Barnhart has, that a premium adjustment is strictly a prospective matter and that participation, if the policy so provides, is a retrospective matter, as Mr. Bartleson has implied.

On this basis the general principles underlying the adjustment of premiums could be the same whether the policy was participating or nonparticipating.

This also brings up the question of classification. Under such a separation as I have suggested it would seem consistent that the original rating classifications would remain unchanged from the standpoint of premium adjustment, but certainly there is no reason why, in determining dividends on a participating policy, new classes and subclasses could not be erected, as is commonly done in life insurance. But I think we need a clear-cut distinction between the area of premium adjustment and the area of participation.

I think Mr. Barnhart has served the Society and the business of health insurance very well in bringing this topic up for discussion at this time. It is a very timely paper, a very welcome one and, I feel, a very competent one.

(AUTHOR'S REVIEW OF DISCUSSION)

E. PAUL BARNHART:

I wish to thank all of those who have contributed to the discussion. The value of this study is greatly increased as a result of these additional ideas. Many important points have been made, and I will attempt to cover each of them in turn with a minimum of repetition in my remarks.

Mr. Shur states that the principles I have proposed are in conflict with two fundamental principles of mutual insurance. Throughout his discussion he appears to treat premium adjustment as completely synonymous with dividend allocation and therefore seeks to base the principles of premium revision directly upon mutual insurance concepts as such. I believe that this is wholly improper. Premium adjustment is a tool used in nonparticipating as well as participating insurance and should be based upon principles common to both. The distinction between participating and nonparticipating insurance should continue to appear at the point of dividend distribution, and there should be no attempt to force premium revision into substitution for the dividend function, a use wholly foreign to its purpose. There is no reason why dividends cannot continue to serve the same function under adjustable premium contracts as under guaranteed premium contracts. If the distinction between the function of the premium adjustment mechanism and that of the dividend mechanism is properly maintained, I think the apparent conflicts cited by Mr. Shur disappear.

As his first principle, Mr. Shur states that "for the purpose of rate revision and in the absence of specific restrictions in the renewal clause, class may be determined by the mutual insurer according to the usual methods used for dividend purposes (*e.g.*, classification by issue age and duration)." His phrase, "in the absence of specific restrictions in the

renewal clause," is quite crucial here. Elsewhere he quotes from the majority opinion in the classic *Rhine* case where it is said that dividend classes are "based upon variation in some factor which entered into the computation of the anticipated costs of furnishing the insurance when the premium is fixed or into the computation of the actual realized cost when the divisible surplus is apportioned. . . ."

I do not believe I am in actual disagreement with Mr. Shur on this point unless he intends to apply the dividend approach to classification in revising rates on policies where the original classification is guaranteed. Under a policy where such a guarantee is present (quite plainly a specific restriction in the renewal clause), an Insurer has most certainly abdicated any right to employ those factors entering "into the computation of actual realized cost" unless these same factors were employed in fixing the original premium. Otherwise, original classification is hardly being guaranteed. I would conclude, therefore, that Mr. Shur prefers the second of the alternative types of clauses suggested in the conclusion of the paper, under which the Insurer simply does not guarantee original class.

I believe, however, that there are many situations where it is quite practical to provide a full guarantee of original class with respect to the premium structure. After all, it is done in noncancelable where no premium revision may be made at all. The class basis of premium revision to be followed must be set up, of course, with this restriction in mind and may therefore differ from "class" as employed in dividend allocation. Thus, "equity of cost" in the mutual sense is achieved not through premium revision, but through dividends in the usual way.

Incidentally, I regard the problem of class equity arising in connection with premium revision to be much more difficult under nonparticipating insurance for the very reason that here equity must indeed be achieved as far as possible solely through the premium structure. This is one of several reasons why I object to any basis that precludes subdivision of the renewal rate table by policy duration or time of issue.

As his second principle Mr. Shur says that "Premium adjustments, just as in the case of dividend adjustments, can reflect past experience as well as future anticipated experience." As point three in his concluding summary he says that "Rate revisions can be viewed in the same light as dividend adjustments and can serve exactly the same purposes."

Here again the trouble arises from the attempt to treat premium revision as a mere alternative to dividend allocation. As I have said, I believe this to be a serious misuse of the premium revision mechanism. Premiums are necessarily prospective by their very nature. Dividends, on the other hand, relate to surplus developed retrospectively and have nothing direct-

ly to do with establishing a level charge applying to future renewal terms of the contract. Their only point of contact with the future is in deciding what portion of existing surplus must be withheld against future contingency and for later distribution. If premium revision is treated as simply an alternative to payment of a dividend, there is serious danger of losing sight of the level prospective nature of the premium. In the extreme case it could degenerate into little more than the annual renewable term premium employed in the casualty insurance contracts of some mutual companies where no dividend is used, the premium merely being adjusted year by year to reflect the experience.

I believe the proper basis of distinction between dividends and premium revision, as suggested by Mr. Miller in his discussion, is:

The function of the dividend is to allocate distributable earned surplus to the various morbidity classes recognized as significant for purposes of practical equity among participating policyholders. It deals with the total fund account retrospectively.

The function of premium adjustment is to adjust the value of future premiums to a change in the expected prospective value of policy costs and benefits. It deals with the total fund account prospectively.

Thus, the revised rate is determined by the calculation of prospective value, just as much as was the original rate except that an existing asset share fund becomes part of the equation. This existing fund cannot, of course, be disregarded without forfeiture of the Insured's level premium equity arising from past premiums.

As to the determination of the value of this standing fund, Mr. Shur objects to my use of the principle of nonrecovery of past loss, again on the grounds that a dividend takes past experience into account. My basic objection to any attempt to employ premium revision to recoup past losses is that this converts the guaranteed renewable instrument into a form of assessment insurance, something a bit different, I think, from mutual participating insurance. If past loss experience becomes so serious as to eliminate dividends entirely, creating a theoretically "negative" dividend, the mutual insurer does not assess the policyholders involved. The loss is charged to the general contingency funds of the Company. Mr. Minor's discussion may appear to suggest that in the *Rhine* case the right of the Insurer to impose such "negative" dividends was upheld. It must be remembered, however, that the issue in the *Rhine* case was whether the disability rider was to be properly regarded as an integral part of the one contract or whether in fact it amounted to a separate contract at a separate premium. The court ruled that there was one indivisible con-

tract. If the entire policy had reached "negative dividend" status, there would have been no assessment imposed. The loss would have been met from the general contingency resources of the Company.

The very same principle should apply, I think, to past loss under adjustable premium contracts. When I speak of past loss, I simply refer to any departure, on the excess side, of actual experience from the expected experience morbidity basis employed in the original premium structure. Presumably, the Insurer will have built a reasonable contingency margin into these original rates to cover this eventuality. Thus, if he sees this margin being eaten away, he should take action before it is completely depleted and the "fund account" on the block of business involved actually has become insolvent. This is what I mean by asserting that the Insurer has a right (and, in fact, an obligation) to act in anticipation of emerging loss rather than being restrained from rate adjustment until the retrospective "fund account" is actually bankrupt.

Many companies, particularly mutuals, make allowance for contingency margins simply by using a very conservative basis of expected morbidity. Where this is the case, then obviously the upper bound of satisfactory actual experience must be set at something less than 100 percent of the expected morbidity basis being used, and revision action presumably would be initiated before experience actually catches up with this standard. A study of the paper should indicate that I do not advocate that past loss, in the sense of an actually insolvent fund account on a block of business, be sustained by the Insurer. What I advocate is that the Insurer be permitted to act in anticipation of such loss so as to prevent it. The principle of nonrecovery of past loss forms, in my opinion, a sturdy and legitimate foundation for such a right of action by the Insurer.

The principle of nonrecovery of past loss serves several other closely related purposes. For one thing, it forces an Insurer either to act promptly or else to choose to accept the resulting loss. Thus, if an Insurer decides to delay revision, he cannot then at some later time go back and make a retroactive charge against the policyholders to recoup the loss. Prompt action is important even with regard to the prospective situation for, as the paper shows, too much delay is apt to produce large rate increases likely to be unacceptable to the policyholders, instigating dangerous anti-selection. If, on top of this, we allow a further retroactive assessment to be superimposed, we are a long way out on the limb indeed.

There is also at least some question of equity involved here. If there is any degree of lapsation provoked by the rate increase, then persisting policyholders presumably will have to pay the retroactive bill on the lapsed policies. It is quite true that there are many instances in mutual

insurance where equity is imperfectly achieved or else based upon debatable arguments; but, if we admit a further strain on equity at this point of past loss and force persisting policies in the block to pick up the unpaid freight on the lapses, we are hardly helping the cause of equity and would seem to be encouraging the danger of assessment spiraling.

The principle of nonrecovery of past loss also serves to clarify and to emphasize the level *prospective* nature of the revised premium, which I regard as very essential to the proper use of this tool. The new premium is a revised computation of the level amount to be charged at each future renewal date beginning with the effective date of revision so as to fund the future morbidity costs which increase with age on a new level basis from that point forward. This sounds very obvious; and one may question why this in itself has to mean nonrecovery of past loss which, after all, could also be figured into such a level charge. However, I think it is extremely vital to the success of the adjustable premium medium that we resist attempts on the part of regulatory authorities to base their approval of rate revisions on a retrospective fund accounting basis, especially if it be insisted that the Insurer demonstrate an actual developed *deficiency* in the retrospective account before approval will be given for a rate increase. I think there is a very real danger of this happening. There is already evidence suggesting that some regulation is veering in this direction, and this would be most unsound. Good regulation, in fact, ought to encourage early adjustment rather than force unwarranted delay. Nonrecovery of past loss serves to emphasize the need for and the legitimacy of prompt revision that stays ahead of losses, and also helps greatly to focus attention on the prospective situation, where it belongs, rather than on the retrospective situation.

There is, however, one matter pertaining to the retrospective fund which deserves to be considered, and this was overlooked in the paper. This is the situation, perfectly possible, where past experience has actually been very favorable yet at the same time the indications are that future experience will be sufficiently adverse as to require a rate increase. This could occur where assumed morbidity is too flat by age or duration, the actual experience proving to be more favorable in early years, more adverse in later years. Inflationary trends could create a similar situation. In any case where experience is on the favorable side of expectations, it would seem that the Insurer should reserve a substantial portion of the resulting excess surplus as an additional contingency margin against the possibility of eventual adverse losses. Thus, a departure of the experience toward the favorable side of expectations should result in additional surplus which could reduce the amount of a rate increase or else make it safe

to delay an increase for a longer time. I do not consider this inconsistent with the principle of nonrecovery of past loss. The right of rate revision is a unilateral right of the Insurer; and, as Mr. Bartleson reminds us, the Insured may well be a captive party by reason of age or impaired insurability. Therefore, while I believe, for the reasons heretofore stated, that the principle of nonrecovery of past loss is a sound and desirable one, I also believe it is a matter of fairness that the Insurer give due credit for past experience on the favorable side of the expected standard underlying the original rates.

To make a parenthetical remark, it might be generally supposed that adequate contingency reserves are less important under adjustable premium contracts than under guaranteed premium contracts. In view of the considerations set forth above on favorable and unfavorable experience, I think the need for adequate contingency funds is every bit as vital under the adjustable premium form of contract as under a guaranteed premium form.

One final comment on Mr. Shur's discussion. He makes the statement that I have relied principally on the idea of "preservation of level premium equity" to support my views on nonrecovery of past loss. The comments I have made above should make it clear that I do not base these views on this principle at all, and I have been unable to find any statement in the paper that can reasonably be construed to imply this. The principle of preservation of level premium equity is intended to protect the Insured from the possibility of forfeiting his original insuring age, through a rate increase that in effect charges him according to his attained age. The question of recouping past loss is quite a different matter.

Let me now turn to Mr. Minor's comments. He begins by criticizing the hypothetical illustrations employed in the paper. It may well be that, on a specific point, an illustration coming out of actual experience carries more authority, if it is applicable. In this regard I believe Mr. Minor's references to the disability experience of the thirties are valuable and have a definite bearing on the general problem of potential rate inadequacies in this field. However, I am not as confident as Mr. Minor seems to be that historical situations of this kind serve as entirely adequate precedents on which to form conclusions. Moreover, actual situations are usually complex and do not afford good opportunity for analysis of single factors. I think hypothetical considerations are of indispensable value in affording the opportunity to study such factors in an isolated way, and I believe this is all the more important because of the very complexity to be expected in the "real thing." I have no doubt at all that actual circumstances developing in the future will defy efforts at neat classification and will most

probably be very frustrating. But this likelihood, I think, heightens rather than reduces the need for careful analysis beforehand and for the development of sound actuarial foundations.

Mr. Minor suggests that, in a situation like that confronted by the disability carriers in the thirties, "solvency might be threatened if rates on existing policies could not be revised to provide the reserves required on a retrospective gross premium valuation." I find this statement somewhat unclear; but, in view of the general context of his remarks, I understand him to mean that the existing fund value to be taken into the equation along with the present values of future premiums and of future costs and liabilities should be the actual asset fund retrospectively accumulated rather than the fund "expected" under the original rate assumptions as I have proposed. Thus, excess past losses, on Mr. Minor's basis, are to be assessed to the policyholders as part of the increase. He goes on to suggest that an insurer should not be found at fault in "waiting a reasonable time for the experience to mature sufficiently so that temporary fluctuations could be clearly distinguished," and later, in quoting from the *Rhine* case, says that "any adverse experience [if] a mere accidental temporary variation due to chance, [is] to be taken care of by the company's contingency fund. . . ."

Two very interesting and important questions are involved here: (1) How long should an Insurer bear with adverse experience in order to distinguish temporary fluctuation before initiating a revision? (2) What losses are properly to be borne out of general contingency funds rather than through increased rates? I believe the first question is at least partly answered by considering how much drain on its general contingency funds an Insurer is prepared to endure. If a "reasonable time" becomes sufficiently long so as to endanger solvency, I would suggest that it has ceased to be reasonable. Adverse losses of such severity or duration as to deplete contingency resources are, in my opinion, adequate justification for action regardless of whether the question of their accidental temporary character has been fully answered or not. Suppose they do later prove to be temporary. If the hazard involved is one subject to such violent or unstable effects, is this not sufficient justification for concluding that a larger contingency margin is required to carry the risk? Original rates should be set at a sufficient level so that reasonable contingency reserves may be accumulated. If this margin does not materialize, or if it begins to rapidly expend itself, then this is evidence that rates are insufficient, barring some other explanation such as defective underwriting or poor benefit design, which are matters outside the scope of this discussion. The conclusion to be reached in any actual situation will, of course, depend upon

a number of factors: the size of the company and its financial condition, the volume of business producing the troublesome experience, etc., and, in particular, just what can be specifically learned about the reasons for the excessive losses. In any event, I do not believe that delay, in the face of losses severe enough to jeopardize solvency, is defensible on the ground that their statistical credibility has not been established.

Turning to the second question, Mr. Minor's remarks seem to suggest that accidental temporary losses are a proper burden for the general contingency fund, whereas an established trend or proved characteristic of the experience is a subject for rate revision even if this must be covered retroactively. I do not agree with this. I believe that either type of loss is a burden for the contingency fund, prior to rate revision. Once a trend is established, justification exists for a review of the rate structure, even though contingency reserves are not endangered, so that level premiums may be corrected as early as possible with a minimum of adjustment. Where the characteristics have not been established, a longer delay is undoubtedly in order so long as contingency margins are not in jeopardy. In either event, however, I believe the proper course is to regard contingency reserves as the proper means of financing developing excess losses, and such reserves should be accumulated with this twofold purpose in view. For reasons I have cited earlier, I do not believe that developed losses are properly to be covered by retroactive assessment incorporated in a rate increase. I continue to advocate the principle of nonrecovery of past loss as a sound and reasonable one and a safeguard against shabby or unsound administration of guaranteed renewable business.

All of this is not to suggest that a company ought to pounce upon its rate structure at every shift in the wind. Nor do I pretend to dismiss the problem as a simple one. It is difficult to say what the results might have been if the disability insurance in the thirties had been administered subject to these principles (and also had been designed and underwritten properly). It must also be conceded that a small company could be confronted with extreme difficulties. But the adjustable premium policy is no panacea that guarantees solvency or insures the insurer against every conceivable mistake or adversity.

At this point it is necessary for me to take specific exception to the inference that the *Rhine* case, along with several others mentioned, stands as an adequate precedent covering the premium adjustment question. As already stated in my discussion of Mr. Shur's comments, the *Rhine* case dealt fundamentally with the question of whether the disability rider was essentially a separable contract. Class and equity of cost are both viewed in this context and also in the context of dividend distribu-

tion which, as I have gone to considerable lengths to demonstrate, is simply not the same animal as premium adjustment. There are just too many points of difference to apply this decision as a direct case precedent covering premium adjustment.

Mr. Minor next takes up the question of the definition of "class," and refers to my statement, on page 492 of the paper, that "all risks insured for the same benefits and paying the same premium belong, per se, to the same class." I believe his discussion lifts this statement rather out of context. The remarks immediately following this one in the paper make it quite clear that I am speaking of a situation where original class is guaranteed and where no definition is offered by the insurer other than what may be implied from the rate structure. A guarantee of original class has meaning only where original class is ascertainable; and, if no auxiliary definition is provided, what other factors of class are in evidence beyond those governing the rate table?

Mr. Minor then presents arguments that "time of issue" is a factor in class. As should be clear from the paper, I fully agree with this. However, it seemed to me that a more satisfactory practical approach would be to specifically and separately allow for this factor outside of "original class" by referring to "duration" in the premium adjustment clause. Originally, I did not regard this as really necessary; and I am still not entirely convinced that a valid case cannot be made for "time of issue" as a perfectly legitimate factor in "original class." However, I have run into so much opposition on this score that it seemed wise to avoid the argument by proposing "duration" as a separate factor affecting the revised rate.

This course also has another advantage. "Time of issue" is not entirely synonymous with "duration." The former is an underwriting and experience factor and is an unchanging element of policy classification. "Duration," however, may be regarded as a purely mathematical factor that changes year by year. Class really varies by "time of issue" only if some variation in underwriting or experience really arises on account of it. "Duration," on the other hand, is a legitimate actuarial variable affecting rate revision, as shown in the paper, even though no experience variation on account of "time of issue" can be demonstrated. Changing duration, as such, is certainly not an element of unchanging original class, so it has seemed to me that separate provision for rate revision varying by duration is desirable; and this also permits recognition of time of issue whether the latter is conceded to be included in original class or not. However, if general agreement with insurance departments (and with insurance company lawyers) can be obtained recognizing year of issue as automatically a factor in original class, I am entirely willing to abandon the separate men-

tion of duration. This solution would certainly permit simpler language.

Mr. Minor states that the question of justification for reclassification is not fully explored in the paper. This is undoubtedly true, but I think the paper has left adequate room for this by proposing two basic types of adjustment clauses, one guaranteeing original class, the other allowing reclassification. Hence, Mr. Minor's comments on this score would seem to simply provide additional argument in favor of permitting the second type of clause proposed in the paper.

He uses one example, however, that I consider quite questionable if I understand his point. This is the reference to a family policy apparently originally priced on a composite rate basis. Now the insurer may not be able to distinguish, at time of issue, couples who will not have children from those who will; but, if the insurer contemplates family class differentiation on the basis of children, then certainly it should require the payment of appropriate additional premium when each new child becomes insured. If the policy was sold on a composite rate basis, probably with the agent's assurance that "your future children will be covered for no additional premium," then it is not at all clear to me how the insurer could later justify any reclassification on the basis of the number of children insured.

Let me say again, however, that I have no quarrel with those who feel that new or latent factors must be permissible in determining class *so long as they do not employ policy provisions guaranteeing original class*. In selecting appropriate contract provisions there is simply no alternative to a careful *a priori* consideration of the possibilities. The contract simply may not be rewritten, however forcefully Mr. Minor's observations may suggest the desirability of being able to do so!

Mr. Bartleson's discussion is of great interest, showing as it does the evolution of the guarantees offered by the Prudential, which has offered guaranteed renewable policies for a longer time than any other company. It is interesting to note that considerable attention was given to the meaning of the guarantee offered and to the necessarily *a priori* consideration of the implications. I have had the feeling that many a company has released guaranteed renewable policies with little, if any, study of what the real meanings of the guarantees are, or of the implications to future administration of the business. I think anyone concerned with this type of coverage will do well to review Mr. Bartleson's remarks thoughtfully, whether he agrees with all the conclusions or not.

On rate adjustment Mr. Bartleson's views stand at the opposite pole from those of Mr. Shur and Mr. Minor. He prefers what the paper lists on page 476 as interpretation (iii) concerning the "original age" basis,

and thus would allow adjustment only to the current rate being charged new entrants of the same age as the original age of the policy subject to revision. Thus, he would not only ignore past loss, the point of greatest concern to Messrs. Shur and Minor, but also would ignore any deficiency in prospective gross premium reserves created by moving from the old to the new "expected" basis.

In drawing a comparison to dividends varying by duration, Mr. Bartleson correctly points out that such dividend variation should not be regarded as parallel to rate adjustment varying by duration. He says, "... the dividend at, say, duration 10 may be larger than at duration 9; but, unless the scale is changed, the later policy will move up a year later to the higher dividend." The kind of situation leading to a rate increase, however, would usually also be the occasion for a change in the scale of dividends, since presumably either of these is brought about by experience departing materially from expectations. Thus, in a situation equivalent to that resulting in a rate revision, the later policy would *not* develop a history of identical dividends, and thus would, in fact, be subject to a different net charge from the earlier one. So there is, I believe, a precedent to be found in participating insurance for a cost to the policyholder varying by year of issue.

Mr. Bartleson states that it is not necessary to vary rates by year of issue if the insurer moves promptly. I think that this depends very much on the circumstances. Usually this will be true if the rate change occurs within the five years or so after original issue of a policy. It cannot be assumed, however, that this will always be the case; and the paper gives several illustrations where, I think, it would be extremely debatable whether it is or is not necessary to vary rates by year of issue. The actuarial difference ordinarily increases the greater the duration since year of issue. Many circumstances could occur where an Insurer would have no reason or basis for revising rates shortly after issue, but would need to do so many years later and would still be acting "promptly" once the situation was recognized; or, alternatively, would find it necessary to make repeated revisions, an example of which is given in the paper. I simply cannot accept the categorical statement that it is not necessary to vary rates by issue year if only prompt action is taken.

On the question of the "actuarial logic" behind nonvariation by duration, Mr. Bartleson supports his view by defining the nonrecoverable loss to include not only the variation in experience to date, but also the difference in the "fund position" of a policy from that expected on the revised assumptions. If this definition be accepted, then I'll grant that the actuarial logic is indeed sustained, but I think this goes far beyond what an

insurer may reasonably be expected to absorb under an adjustable premium contract. I am unable to see where there is any obligation to absorb anything beyond those losses already developed in past experience. That much of it is water under the bridge. But the insurer has a complete right to rebalance the prospective equation. I have no objection at all to an insurer voluntarily adopting the approach suggested by Mr. Bartleson if he realizes just what he is doing. I have very strong objections to such an approach being imposed upon him, as has already been done by more than one insurance department. I believe the business must strongly resist such a development, since it departs from what, I think, is a fair and reasonable interpretation of the insurer's right under a policy where the price has not been guaranteed.

Mr. Bartleson states that the margin in the rates must contemplate this additional potential loss. I understand him to mean here the margin in the original rates, since otherwise it would no longer be "potential" and new entrants, following revision, would then be paying a somewhat higher rate in order to subsidize the inadequacy in the rate on the old policies. I wonder, however, whether there would not be many cases where "contemplation of this loss" is exactly what an insurer would *not* be prepared to do, for the same reason for which he is using an adjustable premium rather than a guaranteed one: namely, that he is not prepared to forecast the cost of the risk to that extent. The idea, moreover, appears to me to be self-contradictory. How can it be possible for a rate to contain a margin that contemplates its own deficiency?

It may be a reasonably straightforward thing to promise an individual that his rate will not be increased above the rate the company may later charge a new entrant of the same original age. I think it is equally straightforward to agree to insure on the basis that, if experience warrants, price will be adjusted to bring the cost into rebalance with the benefits to be provided; and this, in my opinion, is the interpretation more compatible with the adjustable premium concept. I am aware that one of the arguments advanced for Mr. Bartleson's approach is the idea that the public will not understand or accept a basis where the rates applicable to old policies can exceed those charged on new ones. Why can't the public understand this? Hasn't the older policy enjoyed a more favorable rate over the interim than what the new policy is subject to from the outset? Moreover, I think the argument assumes that the general policyholder is going to sit down and make a detailed analytical comparison of his coverage and price with that of the most comparable policy then on the market. This won't happen very often! I also do not see the relevance of Mr. Bartleson's point that the "captive" insured will be subject

to a worse guarantee than he would enjoy under yearly renewable term insurance. I think this, again, depends entirely on the particular example. Furthermore, this will be true of any new issue rate for a period of years. A level premium is, of course, initially higher than the corresponding annual renewable term premium. I think the really relevant point is that the revised rate on the old policy will still fall *below* the level premium for a new entrant at the *attained* age of the insured, since there is a reserve equity entering into the equation for which the insured receives due credit when his new rate is established. The real problem involved here is not public acceptance, but simply insurance department acceptance; and it is my hope that all of this discussion will help to persuade the several departments that the right of the insurer to restore the prospective actuarial balance is indeed both necessary and desirable, or at the very least must be permissible.

The questions raised by Mr. Coates' discussion have already been discussed at some length. In his third paragraph he too raises the question of whether the responsible block of policies should not be assessed for their own past experience. He thus takes, on this point, a position similar to that occupied by Mr. Shur and Mr. Minor. Let me say here that I sympathize with the motive of equity that lies behind this view; but, for the several reasons I have already advanced, I do not believe it is a good principle.

Mr. Coates also favors a reasonable latitude of reclassification. I have already expressed my views on this point, particularly in relation to a provision guaranteeing original classification.

Mr. Hart questions the need for so much anxiety over the question of high standards protecting the insured, making the observation that the history of the business simply fails to show any excessive inclination on the part of insurers to raise rates or otherwise deal highhandedly with their policyholders. I agree very much with the spirit of these comments, and I think it is true that the vast majority of companies are very sensitive to fair play and to public relations, voluntarily maintaining the highest ethical standards. Some few, however, have been known to indulge in questionable practices, rather more so, perhaps, in the Accident and Sickness field than in Life. I think that only an occasional example of unfair or misunderstood practice could create serious repercussions, especially in this era when the specter of government invasion of the field looms so large. The paper actually grew out of the fear that a few insurance departments were tending to force unsound interpretations upon the premium adjustment clause. I felt that if this were to be corrected it would be necessary not only to clearly point out what is unsound, but

also to establish a basis on which thorough reinsurance may be given to regulatory authorities that the guaranteed renewable medium is being administered on a fair and legitimate basis with due regard to the rights of the insured.

Mr. Hart's suggestion on the use of a signed amendment could be very valuable if matters got completely out of hand on some coverage to the point of a downright uninsurable hazard; but, if this were done, the company would certainly have to be extremely careful to avoid the charge of threatening a kind of "blackmail"—either sign or face an exorbitant rate increase. Such a procedure could also have a disastrous antiselective effect. It would also be most unfortunate if a company were to indulge in reckless experimentation with the idea of taking recourse to an "out" of this kind. Nevertheless, the suggestion could become practical in an extremely difficult situation. If it were ever done, I think it should certainly be carried out only as a last recourse and with the complete support of regulatory authorities. I wonder, too, along with Mr. Hart, what the result would have been had the disability insurance of the thirties been subject to a properly administered premium adjustment provision. I think it is well to remember here that much of that business was designed unsoundly and issued subject to defective underwriting rules, *e.g.*, lifetime sickness benefits and excessively high issue limits. Then, too, the examples of utterly inadequate rates so common to that disastrous period should clearly demonstrate the need for very prudent development of the guaranteed renewable lines today. I wonder how much of our spreading major medical coverage is soundly designed or priced at the present time. Premium adjustment, again, is not simply some magical "insurance for the insurer" against the deleterious effects of unsound benefits and careless underwriting.

I agree with Mr. Hart's observation that too heavy a burden of proof or justification for a rate revision could lead to serious difficulties. As I have already mentioned, I am strongly opposed to any demand for rigid retrospective fund accounting, since I think there is too much danger of failure to appreciate the essentially prospective nature of the problem, and also too much likelihood of disapproval if the fund is not in an actually insolvent condition. I think any actuarial justification should be limited to a reasonable demonstration that the premium can no longer be expected to support future experience without too much refinement being demanded as to the precise experience classifications involved in the company's supporting statistics. Surely there is a practical, happy medium!

Mr. Walker's remarks are a valuable addition to the discussion in pointing to the fact that there are other perfectly legitimate methods of

arriving at gross premiums in addition to the Cammack formulas employed for the illustrations in the paper. He points out that under a method where the premium is designed to accumulate the reserve at the end of a specified period of years, any revision of expectations bringing about a rate revision will lead again to differentiation by policy duration, perhaps even more definitely than when a Cammack technique is used. An Insurer must be permitted to carry out revisions on a basis consistent with its own gross premium structure. Under the kind of gross premium structure referred to by Mr. Walker, if the rate revision came any later than, say, the tenth year in an instance where the amortization of first year cost and the accumulation of the reserve was originally to occur by the twentieth year, it would seem as a practical matter that the balancing duration would possibly have to be extended somewhat, especially if the valuation reserve basis were also to be changed. The matter would again depend upon the particular factors.

Reference has been made earlier in this discussion to Mr. Miller's comments dealing with the retrospective nature of dividends as opposed to the prospective nature of premiums, a view with which I obviously agree.

In concluding, I wish to express again my appreciation to all those who have contributed to this whole discussion. The several viewpoints expressed reveal considerable divergence in the approach made to certain aspects of the subject, particularly in the areas of reclassification and of the role of past losses and gross premium reserves in rate revision. It can be nothing else than helpful to have these matters aired, and I believe this objective of the original paper has been amply fulfilled.

Several of the discussants have taken me more or less to task for the rather bald statement in the opening sentence of the paper that the guaranteed renewable policy is a "unique new instrument." It has been pointed out that a number of at least partial parallels can be found in the history of the business so that the word "unique" is not altogether correct. Perhaps this can serve as one more reminder that the very fascinating subject of insurance is a living, changing, yet very unified field of economic science.