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THE RETURN OF PREMIUM BENEFIT IN HEALTH INSURANCE

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ABSTRACT

DURING the past five or six years, much interest has developed in the concept of return of premium used in conjunction with health insurance. The purpose of this paper is to analyze several existing versions of the return of premium provision and to attempt to develop a logical critique of the concept, with the object of suggesting certain criteria (cost, equity, and compatibility with the purpose of the basic coverage of the health contract) which could serve as a basis for evaluating the merits of various forms of the provision. Further, the paper discusses the actuarial considerations involved in the calculation of premiums and reserves for the benefit and reviews several other miscellaneous considerations.

It is hoped that this study will bring sound actuarial principles to bear on this topic and will encourage more positive and constructive evolution of this interesting provision as applied to the field of health insurance.

I. COMMON VERSIONS OF THE PROVISION

A. *100 Per Cent Return with No Claims*

The original version of the provision, probably first used with hospital policies, provided that, if the insured had had no claims at all over a period, such as the first ten policy years, then 100 per cent of the premiums paid over the ten years would be returned. Sometimes the return included the premiums paid for the provision itself, and sometimes it did not.

This version has obvious shortcomings. It has an extreme inherent degree of inequity, since return of all or no part of the premium hinges on the mere contingency of incurring no claim at all versus even the most minor one. It is also evident that the provision discourages the submission of small claims, particularly toward the end of the policy decade, and for this reason its operation is judged by many to be contrary to the purpose of the basic insurance itself.

These objections led to the development of the following modified version, which softened the operation of the provision and appears to have been more acceptable to regulatory authorities.

B. *80 Per Cent (or 100 Per Cent) Return with 20 Per Cent or Less Claims*

The following is one example of contract language used with this version:

> Upon the completion, prior to the Insured's Age 65, of any period of 10 consecutive policy years during which time benefits due and payable under this policy (including waived premiums) have in the aggregate equalled 20% or less of the premiums paid for this policy during such 10 year period, and provided all premiums falling due on this policy during such 10 year period have been paid (or waived as provided in this policy), then the Company will pay an amount equal to:
>
> > 80% of the total amount of premiums paid (or waived) for this policy during such 10 year period, *less* the total of all such benefits which have become due and payable during such period.
>
> Upon the completion of any period of less than 10 consecutive policy years which terminates as of the Insured's Age 65, during which time benefits due and payable under this policy (including waived premiums) have in the aggregate equalled 20% or less of the premiums paid for this policy during such period, and provided all premiums falling due on this policy during such period have been paid (or waived as provided in this policy), then the Company will pay an amount equal to:
>
> > 60% of the total amount of premiums paid (or waived) for this policy during such period, *less* the total of all such benefits which have become due and payable during such period.
>
> No payment will be made with respect to any 10 year period or period terminating at the Insured's Age 65 during which benefits due and payable have equalled more than 20% of the premiums paid, and no policy year may be included in more than one period in determining the benefit payable under this provision.

This version attempts to answer the objection raised against the "no claims" provision to the effect that it discourages small claims by allowing claims up to 20 per cent of the premiums paid during a period. Note that it also refers to *any* period of ten consecutive years rather than to fixed policy decades measured from the issue date. This eliminates a second obvious weakness in the original provision, which is that, once a claim has been incurred disqualifying the insured from any possible return, there is little reason for him to pay any further premium for the return provision. This second version always holds out the chance that another policy year may be the beginning of a qualifying ten-year cycle.

The primary purpose of the idea of returning 80 per cent rather than

100 per cent is simply that this materially reduces the actuarial cost of the provision, which can become extremely great. Further discussion will be given to the question of how various factors affect the cost at a later point in this paper.

A little reflection will reveal that this "20 per cent claims" version is, in reality, not particularly less discouraging to the submission of small claims than the original "no claims" version. If one claim has already been submitted, a second very small one may well tip the balance over 20 per cent, so that, instead of qualifying for an 80 per cent return, including claims, the insured may get back only, say, 22 per cent in the form of claims alone. Further, this version may well discourage the submission of a not-so-small claim. Suppose that the insured has gone, say, seven years with no claims, so that he has a considerable "stake" built up in the probability of an 80 per cent return in three more years. If he now incurs a claim which in all likelihood will exceed 20 per cent of ten years' premiums but will still fall significantly short of 80 per cent, it is obviously to his interest not to submit the claim. Furthermore, suppose that he elects not to submit this claim, and two years later he incurs another claim so large that there is no question but that it should be submitted. The time allowed for submission of the earlier claim has now expired, and he will very probably feel "cheated."

A common objection tendered against both the "no claims" and the "20 per cent claims" provisions is that of "discrimination." It is argued that the operation of the provision "discriminates" among policyholders by dividing them into classes, a posteriori, according to who has claims and who does not. Thus, through the mechanism of return of premium, those who have no claims enjoy a very low "net premium," while those who have claims pay even more for their coverage than would be the case if there were no return of premium "benefit" at all. A closely related objection is that the provision creates a situation in which the "sick subsidize the well."

These considerations may not be entirely without merit, but the logic is very much open to challenge. For example, one possible rebuttal of the "discrimination" argument is to regard the provision as a benefit rather than merely as a refund of premium and to insist that all the insureds comprising the same class at time of issue do pay exactly the same premium and each receives benefits in relation to definite contingencies clearly set forth in the contract purchased. One may further question whether equivalent "discrimination" does not exist in the operation of a ten-year endowment life policy, as compared to a ten-year term life policy. Under either policy, those who die before the expiration of the decade get

the same death benefit, yet under the endowment policy a higher premium must be paid to fund the "return of premium" to those who are living at the end of ten years. Under the same logic as that supporting the charge of "discrimination" above, it could be argued that this is a case of the "dying subsidizing the living," or, if you will, a "refund of premium" so that those fortunate enough to be alive after ten years got their death protection at a much lower net cost than those who died. There would not appear to be any essential difference between this situation and the health policy incorporating a ten-year return of premium provision.

It is hardly necessary to base objections to the "no claims" or "20 per cent claims" version of the return of premium provision on such debatable arguments as these, when there are very clear and unequivocal objections, which, in summary are the following:

1. These provisions are extremely inequitable. First, the difference of a single small claim can disqualify the insured entirely from the return benefit. Second, they contain no nonforfeiture safeguard, and this is a major defect not heretofore discussed. Each insured is paying an increased premium for a benefit that he cannot possibly collect on in less than ten years. Accordingly, if he lapses or dies before the end of the policy decade, he forfeits his entire "equity" in the probability of a return.
2. These provisions operate in conflict with the basic purpose of the health insurance contract in which they are included. They will frequently work to discourage the submission of claims to which the insured is entitled and for which, presumably, he purchased the basic contract and is paying his basic premium.

These two considerations will serve, later, as a starting point from which to develop a satisfactory version of the return of premium provision.

C. *Return, at Contract Termination, of 100 Per Cent of Premiums Reduced by Any Claims*

Under this provision, the insured is entitled, at the contract-termination date (such as age 65), to a return of 100 per cent of all premiums paid reduced by *whatever* claims have been paid.

This provision, quite clearly, overcomes objection 2 just cited, because the insured stands to lose nothing by filing a claim. He is well advised to file all claims promptly, because he receives at the time of claim the same amount of return that he would otherwise receive later and there is a proportionate reduction in final return as claims increase, all the way to the level where claims equal or exceed total premiums paid.

The provision does not, however, overcome objection 1, because it has an even worse situation of forfeiture than the ten-year return provision. Under the latter, the qualifying policyholder gets his return if he keeps the contract in force ten years. Under this terminal return provision, he may have to keep the contract in force many years in order ever to qualify for the return benefit. Hence this provision has little more to commend it than the first two described.

II. CHARACTERISTICS OF A SATISFACTORY PROVISION

It is apparent from the preceding discussion that a satisfactory provision must be one that has certain characteristics of life insurance nonforfeiture provisions. Only some kind of nonforfeiture guarantee can avoid the extreme inequities referred to earlier.

Occasionally, return of premium provisions such as I have described are referred to as "resembling" cash value provisions, but nothing could be further from fact. The typical return of premium provision is the diametrical opposite of a true nonforfeiture provision, and the pricing of the provision, as customarily worked out, depends heavily on *forfeiture*, through lapsation, in order to fund the eventual returns becoming payable to the survivors. In short, it is a modified sort of tontine pure endowment.

Any reasonably equitable return of premium benefit must incorporate elements of nonforfeiture, and when this is done the resulting provision will, indeed, closely resemble the cash value concept of a life insurance policy. If we start with the third provision described earlier, and add to it features that will provide reasonable nonforfeiture guarantees, the result will be an actuarially satisfactory return of premium benefit.

Thus, if the policy is to have a 100 per cent return of premium, reduced by claims, at termination, it should provide for some gradation toward this eventual level, starting from 0 per cent somewhere within the first few policy years. For example, the first policy year with a return value might reasonably be the fifth, with, say, a 5 per cent return, grading gradually toward 100 per cent as of some reasonable duration or at the terminal date. It is obvious that the selection of these durations and percentages should bear some reasonably equitable relation to the net asset share accumulations on the benefit, which will, as of the terminal duration, be sufficient to fund the final return to those qualifying, in the amounts to which each is entitled, after the company has realized a reasonable margin. When evolved to this state, the benefit should probably not even be labeled a "return of premium" benefit but rather a "contingent termination benefit," or "contingent endowment," for that is precisely what it has become.

III. DETERMINATION OF THE COST OF RETURN OF PREMIUM BENEFITS

The cost of the return of premium benefit is amazingly sensitive to the variables, and yet one encounters return of premium riders used, for example, with disability income policies in which one uniform percentage premium loading is used with all possible elimination periods, issue ages, and occupational classes. The actuarially computed cost of such a rider may well vary across a range of as much as 10–500 per cent, over all these variables, yet the loading used may simply be a uniform 30 or 40 per cent of the basic premium.

I have contended that the "no claims" and "20 per cent claims" provisions should be rejected as unacceptable. Nevertheless, these are in fact in widespread use, and consideration of actuarial methods of determining their expected cost is therefore of importance. Furthermore, actuarial evaluation of the cost of these simpler provisions is a relatively more elementary task than is cost determination for what I have described as a "satisfactory" provision and serves as a useful starting point for tackling the rather complex job of pricing the more sophisticated type of provision.

A. *Cost of the "No Claims" Provision: Return on Fixed Anniversary*

The most elementary pricing problem is that of the "no claims" provision paying return of premium as of a fixed policy anniversary. Consider the general case of a provision paying a fraction y as premium return (including the return of premium loading) as of the nth policy anniversary provided that the policy is then in force and no claims have been incurred. We will express the return of premium premium loading as a percentage, p, of the basic policy premium, and, for illustrative simplicity, we will assume a constant, k, as the ratio of the experience net premium to the gross premium; that is, the gross premium anticipates a present value loss ratio of k.

Further, let ${}^m l$ represent the number of original policyholders still persisting as of year m, under a given radix ${}^1 l$ and set of persistency assumptions. Then, let

$$ {}^m D = {}^m l \cdot y^{m-1} $$

serve as a special persistency commutation function, and let

$$ {}^n Z = \sum_{m=1}^{n} {}^m D \, . $$

Let

$$ {}^n X_x^s = v \cdot \prod_{m=1}^{n} (1 - r^s)_{x+m-1} \cdot {}^n D \, , $$

where $(1 - r^e)_u$ is the "no claim" rate at attained age u for a health benefit with an elimination period or deductible of e, and x is the issue age. Then

$$ {}^nZk \cdot {}^np_x = {}^nX_x^e yn(1 + {}^np_x) \tag{1} $$

or

$$ {}^np_x = \frac{{}^nX_x^e yn}{{}^nZk - {}^nX_x^e yn}. $$

A sample calculation will be useful in illustrating the manner of applying Z and X, as well as in illustrating what the actuarial cost of the benefit may be.

Assume the following: interest at 5 per cent; persistency at 70 per cent the first year, 85 per cent the second, 90 per cent the third, and 95 per cent each year thereafter (for simplicity, let us also assume that this applies to all policies irrespective of whether they produce claims or not); $k = 0.6$; $y = 1$ (that is, 100 per cent return); and $n = 10$. As to X, let us assume as a basis the 1964 CD Table, applying to a disability policy with a seven-day elimination period. Calculation will be made for issue ages 30 and 50.

The values of r_x^{7d} at the appropriate central ages follow: 32, 0.116; 37, 0.126; 52, 0.164; 57, 0.181.

Use of the 1964 CD Table here is *illustrative only*, and the results should not be taken as indicative of the absolute levels of actual premiums, which would depend on the expected morbidity, expenses, and so forth, of any particular company. The illustrative results, however, give a general idea of possible cost levels and a good relative indication of the effect on costs of variation in certain parameters.

For simplicity, let us regard these central age values as applicable throughout each quinquennium, and let us also disregard any select morbidity. Thus the annual probabilities of NO claim, $(1 - r^{7d})$, during each quinquennium are as follows: 32, 0.884; 37, 0.874; 52, 0.836; 57, 0.819.

There is a potentially dangerous oversimplification implicit here, which is that the probability of claim in each year is independent of prior claim history. Actually, this is not the case; a policy with a prior claim is more likely to repeat, in general, than a claim-free policy is likely to have an original claim. If this tendency were taken into account, the ten-year cumulative probability of no claim would be somewhat higher than our assumptions will produce, and therefore the cost of the return premium benefit would also be higher. For simplicity, however, we will ignore this point except to warn of its possible effect on the outcome.

Let us develop the computation, using a radix of 10,000 issued policies. The value of ${}^{10}Z$ is developed as shown in Table 1.

For ${}^{10}X_x^e$ we need to discount ${}^{10}D$ to the end of the tenth year, or $2,537 \times 0.95238 = 2,417$. Then ${}^{10}X_{30}^{7d} = 0.884^5 \times 0.874^5 \times 2,417 = 665$; ${}^{10}X_{50}^{7d} = 0.836^5 \times 0.819^5 \times 2,417 = 364$.

From these values and using formula (1), we obtain ${}^{10}p_{30}^{7d} = 0.3127$, or 31.27 per cent loading of the basic premium, and ${}^{10}p_{50}^{7d} = 0.1499$, or 14.99 per cent loading. Thus issue age is evidently a significant factor, the percentage loading at age 30 being more than twice that at age 50.

Just for amusement, let us see what the corresponding computation would be for a 180-day elimination period. From the 1964 CD Table we get for r_x^{180d} at the central ages the following: 32, 0.00192; 37, 0.00245; 52, 0.00793; 57, 0.01327, so that the annual "no claim" probabilities are: 32, 0.99818; 37, 0.99755; 52, 0.99217; 57, 0.98673.

TABLE 1

Year m (1)	${}^m l$ (2)	v^{m-1} (3)	${}^m D = (2) \times (3)$
1....	10,000	1.00000	10,000
2....	7,000	0.95238	6,667
3....	5,950	0.90703	5,397
4....	5,355	0.86384	4,626
5....	5,087	0.82270	4,185
6....	4,833	0.78353	3,787
7....	4,591	0.74622	3,426
8....	4,362	0.71068	3,100
9....	4,144	0.67684	2,805
10....	3,936	0.64461	2,537
			$\Sigma\, {}^m D = {}^{10}Z = 46,530$

The X values therefore are: ${}^{10}X_{30}^{180d} = 0.99818^5 \times 0.99755^5 \times 2,417 = 2,366$; ${}^{10}X_{50}^{180d} = 0.99217^5 \times 0.98673^5 \times 2,417 = 2,174$, from which we obtain the following interesting results: ${}^{10}p_{30}^{180d} = 5.5566$, or 555.66 per cent loading, and ${}^{10}p_{50}^{180d} = 3.5189$, or 351.89 per cent loading.

Evidently the elimination period has a rather considerable effect on the cost of the return of premium benefit. In spite of this, I have encountered one or two return of premium riders for which the charge was a uniform 30 or 40 per cent of the basic premium, regardless of a wide choice of elimination periods.

We have not taken into account any "savings" resultant upon the effect of the provision in discouraging small claims. We may, however, reasonably assume that the cumulative effect of this will be more money paid out as return of premium than is saved through nonsubmission of claims, so this would seem to require *more* loading for the provision rather than *less*, as is sometimes argued.

Let us consider the effect of a variation in the percentage returned. Suppose that this is 80 per cent rather than 100 per cent. Then, for the seven-day elimination calculation, formula (1) gives

$$ {}^{10}p_{30}^{7d} = \frac{665 \times 0.8 \times 10}{46{,}530 \times 0.6 - 665 \times 0.8 \times 10} = 0.2354 $$

and

$$ {}^{10}p_{50}^{7d} = 0.1165 . $$

The ratios of these values to those for a 100 per cent return are 0.2354/0.3127 = 75.3 per cent and 0.1165/0.1499 = 77.7 per cent, so that the cost reduces in greater proportion than does the reduction in percentage return, as would be expected.

Let us make the same comparison on the 180-day elimination plan. We get, for an 80 per cent return, ${}^{10}p_{30}^{180d} = 2.1055$ and ${}^{10}p_{50}^{180d} = 1.6523$.

The ratios of the 80 per cent to the 100 per cent values are 2.1055/5.5566 = 37.89 per cent and 1.6523/3.5189 = 46.96 per cent. Hence, payment of an 80 per cent return instead of 100 per cent helps the 180-day plan immensely, but not nearly enough to bring the cost within practical limits.

Assumption of a heavier incidence of claims, such as that for an occupationally rated policy or a policy on a female life, will evidently have an effect similar to that of issue age 50 in relation to issue age 30; obviously the higher the rate of claim the lower the percentage loading required for the return of premium provision.

Another sensitive factor is the value of k, the present value loss ratio. Suppose that, in our original calculations, we had assumed a value for k of 0.75 rather than 0.6. Then the results, for the seven-day elimination period at ages 30 and 50, would be ${}^{10}p_{30}^{7d} = 23.54$ per cent, compared to 31.27 per cent for $k = 0.6$, and ${}^{10}p_{50}^{7d} = 11.65$ per cent, compared to 14.99 per cent for $k = 0.6$.

For the 180-day elimination period, at ages 30 and 50, the results are ${}^{10}p_{30}^{180d} = 210.55$ per cent, compared to 555.66 per cent for $k = 0.6$, and ${}^{10}p_{50}^{180d} = 165.23$ per cent, compared to 351.89 per cent for $k = 0.6$.

The effect of changing k from 0.6 to 0.75 is identical to that of changing y from 1 to 0.8 (as is mathematically obvious).

What happens if we vary the persistency assumptions? Our original persistency assumption represents rather good health insurance persistency. Suppose we assume the following: 60 per cent the first year, 80 per cent the second year, and 90 per cent each year thereafter.

Under this change in assumptions, we have ${}^{10}Z = 37{,}476$, and the $v \cdot {}^{10}D$ factor needed for X is 1,566.

Then our original calculations, for 100 per cent return after ten years and a seven-day elimination plan, become ${}^{10}p_{30}^{7d} = 23.7$ per cent and ${}^{10}p_{50}^{7d} = 11.72$ per cent; these results are 75.8 and 78.2 per cent of the original assumption values. Hence the tontine effect, as expected, is considerably increased under these heavier persistency assumptions, although it will be evident that the exact persistency assumption is a less critical factor than any of those affecting the actual probability of claim.

The rate of interest has an effect equivalent to the persistency assumption; an increase in the interest rate is the same as a mathematically equivalent increase in lapse rates, except for the final discount to the end of the tenth year.

All these sample calculations take into account only the first policy decade. The contract will usually provide that the return benefit apply to each policy decade in succession, so that the charge for the provision and its applicability extend throughout the renewal period. If such is the case, the actuarial principles already described are simply extended further. Normally, this will result in some reduction in the percentage loading if calculated as a level charge from original issue, because of the increasing incidence of claims. For example, if we carry the original calculation, for a seven-day elimination period plan issued at age 30, through a second ten-year cycle, the loading becomes 29.94 per cent, compared to the value of 31.27 per cent we obtained for the first ten-year cycle only. Special attention may need to be given to the possibility of tenth-year lapses among those collecting their returns and hence to an antiselect body of survivors continuing after ten years.

A final comment is in order with regard to the persistency assumptions. I stated, in setting out the original assumptions, that we would assume a persistency scale applying uniformly to all renewing policies regardless of claim history. In all probability this will not be the case, especially during the second quinquennium, when persistency among the "no claims" policies may well be measurably better than that among policies with claims, because of the expectation of qualifying for return. This situation, normally desirable because it is the reverse of what would ordinarily be regarded as antiselect lapsation, may here tend to be itself the antiselect effect because it may drive up the cost of the return benefit more than it will depress the basic policy claim costs.

B. *Cost of the "No Claims" Provision with Rolling Ten-Year Cycles*

As has been mentioned, the use of a provision that provides for return of premium at the end of *any* ten-year cycle, rather than in relation to fixed policy decades, will help to avoid lapsation among policyholders who

have had perhaps a single claim that would destroy the possibility of a return on the tenth anniversary. As we will find, it also costs considerably more, under our assumptions. Computation of the actuarial value of this type of benefit becomes more complex, for it must deal with the value of the return benefits becoming payable on each anniversary, commencing with the tenth.

Let us, for the moment, continue to deal with the actuarially simple "no claims" provision but extend this to the rolling ten-year-cycle basis.

As before, let

$$ {}^{m}D = {}^{m}l \cdot v^{m-1} ; $$

let

$$ {}^{w}Z = \sum_{m=1}^{w} {}^{m}D , $$

where w is the in-force period over which the calculation is to be made.

Normally, this should be the entire renewal period of the contract, unless some lesser period, such as twenty or twenty-five policy years, is deemed sufficiently long to yield an adequate cost determination.

Let us now introduce the special commutation function

$$ {}^{n}_{m}X^{e}_{x} = [{}^{n}_{m}(X)^{e}_{1,\,x} + {}^{n}_{m}(X)^{e}_{2,\,x}]v \cdot {}^{m}D , \tag{2a} $$

in which n is the contractually required period of claim-free years; m is the policy duration at the completion of which the insured qualifies for return, on the basis of n continuous claim-free years (hence $m \geq n$); and e, as before, identifies the plan elimination period or deductible, in order to determine the annual claim rate r,

$$ \begin{aligned} {}^{n}_{m}(X)^{e}_{1,\,x} &= [{}_{m-n}{}^{n}(X)^{e}_{1,\,x} + {}_{m-n}{}^{n}(X)^{e}_{2,\,x}] \cdot \prod_{i=x+m-n}^{x+m-1} (1 - r^{e}_{i}) , \\ {}^{n}_{m}(X)^{e}_{2,\,x} &= (r^{e}_{x+m-n-1}) \cdot \prod_{i=x+m-n}^{x+m-1} (1 - r^{e}_{i}) , \end{aligned} \tag{2b} $$

and we define, for starting values,

$$ {}^{n}_{0}(X)^{e}_{1,\,x} = 1 ; \qquad {}^{n}_{0}(X)^{e}_{2,\,x} = 0 . $$

Thus $(X)_1$ evaluates the probability of qualifying at the end of an n-year cycle, having also qualified as of the end of the preceding n-year cycle, and $(X)_2$ evaluates the probability of qualifying at the end of an n-year cycle following a year in which a claim was incurred.

Further, let us define the special commutation function

$$ {}_{w,\,m}{}^{n}Y^{e}_{x} = \sum_{i=m}^{w} {}^{n}_{i}X^{e}_{x} . \tag{2c} $$

Then the formula for computation of the required return of premium loading on a level premium original age basis becomes

$$ {}^{w}Zk \cdot {}^{n}_{w}p^{e}_{x} = {}_{w,\,n}{}^{n}Y^{e}_{x} \cdot yn(1 + {}^{n}_{w}p^{e}_{x}) \qquad (3) $$

or

$$ {}^{n}_{w}p^{e}_{x} = \frac{{}_{w,\,n}{}^{n}Y^{e}_{x} \cdot yn}{{}^{w}Zk - {}_{w,\,n}{}^{n}Y^{e}_{x}}, $$

where the meaning of the remaining symbols is the same as it is in formula (1).

An illustrative calculation is carried out in Section I of the Appendix.

C. *Cost of the "20 Per Cent Claims" Provision (Rolling Ten-Year Cycles)*

The actuarial problem of evaluating the cost of this type of provision becomes exceedingly complex, because an intricate interplay of probabilities comes into operation. If the probability of a policy actually developing a claim history falling into the "20 per cent or less of cumulative premiums over n years" category is quite small, then perhaps the problem can be disposed of simply by estimating an additional loading to cover this minor contingency. But, if the probability is significant, it needs to be accounted for with some care, and a complex computation of probabilities emerges, since the measurement must deal with both the amounts and the incidence of claims that are small enough in the aggregate not to disqualify the policy for the return benefit.

One method of dealing with the problem is by computer simulation, synthesizing the values by means of a mathematical population model. It is desirable, however, to have available alternate approximate methods which can be handled less elaborately. The problem is complicated greatly by the fact that the unknown we are seeking, the return premium loading, is itself a factor involved in its own solution, since the 20 per cent limitation on claims is an amount that depends on the value of the loading. I am not aware of any direct method of solving for the required loading, so a trial method of successive approximation must be resorted to. An example of one approximation technique is developed in Section II of the Appendix.

From the illustrative cost calculations shown in Section II of the Appendix, it will be evident that introduction of the "20 per cent or less claims" feature can be surprisingly expensive, particularly on a short elimination period plan where the probability of small claims that will not disqualify is quite high. The "no claims" provision, with 100 per cent return on a rolling ten-year-cycle basis, produced, under our illustrative

assumptions, a gross loading of 51.36 per cent. Here, under comparable illustrative assumptions, the first trial computation for a 100 per cent return, with 20 per cent or less claims, develops 281.2 per cent, and this trial result is low. Even the 80 per cent return version, developing possibly as much as a 150 per cent loading, is remarkably expensive under these illustrative assumptions.

As before, let us consider the effect of a change in k, the assumed net premium or loss ratio constant. We have been assuming 0.6 for this value. As shown earlier, changes in the value of k will have a substantial effect on the required gross loading. For example, in the 80 per cent return calculation in Section II of the Appendix, which turned out to be 138.0 per cent, if we assume instead that $k = 0.75$, then the value of p drops sharply to 86.5 per cent. Thus, if a high proportion of the gross loading can be applied as the net premium for pure funding of the return benefit, the required gross loading can be reduced considerably. Even so, these sample results suggest that much of what is currently on the market may be seriously underpriced and, further, that the commonly encountered versions of the return of premium benefit, allowing for a percentage of claims, may simply not be practical in view of their probable high cost under typical assumptions.

D. *Cost of Return, at Contract Termination Only, of 100 Per Cent of Premiums Reduced by Any Claims, including Nonforfeiture Feature*

Before considering the nonforfeiture type of provision, let us estimate the cost of a provision returning, only to those policyholders renewing to the *terminal age*, the fraction y of premiums paid, reduced by any claims paid on the policy. It will be of interest to determine the approximate cost of this type of provision in comparison with the rather expensive ones we have been investigating so far.

The calculation is actuarially very simple except for estimating the value of the reduction for claims paid. This time, instead of valuing the loading as a percentage of the basic gross premium, let us use the alternative approach of obtaining the result in dollars, using as a unit a benefit of $100 monthly income. Let

G_x = Policy basic gross premium at issue age x;
w = Number of years to contractual termination;
${}^wZ = \sum_{m=1}^{w} {}^mD$, as before;
${}^wD$ = Persistency $\times$ discount commutation factor for terminal year;
k = Ratio of net to gross return premium loading, or present value loss ratio;

S'_z = Portion of annual claim cost per unit of benefit at attained age z which does not exhaust 100 y per cent of cumulative total premium.

Then the formula for the dollar value of the return of premium loading, L, per each unit of benefit is

$$L_x = \frac{v \cdot {}^{w}D\left[wyG_x - \sum_{z=x}^{w-1} S'_z\right]}{{}^{w}Zk - wyv \cdot {}^{w}D} . \qquad (4)$$

TABLE 2

	Central Age						
	32	37	42	47	52	57	62
Probability of claim	0.116	0.126	0.137	0.150	0.164	0.181	0.202
Probability of claim's enduring for 17.5 compensable months	0.00075	0.00099	0.00146	0.00244	0.00409	0.00765	0.01376
Probability that any single claim will exceed 17.5 compensable months	0.00647	0.00786	0.01066	0.01627	0.02494	0.04227	0.06812
Probability that any single claim will exceed 9 compensable months	0.00948	0.01111	0.01533	0.02200	0.03293	0.05359	0.08564
Claim cost for first 9 compensable months (per $100 monthly)	11.01	12.81	15.31	18.74	23.34	30.51	41.13

The basic problem is that of estimating the S' term. Again, trial solution would appear to be the best available method. Let us assume again that the benefit is a 24-month maximum period after a seven-day elimination period, paying $100 monthly. Assume that the basic policy premium per $100 monthly is $40 and, as a trial, assume that L will be $10, a 25 per cent loading. We will make a sample calculation for issue age 30, with $y = 1$ (i.e., 100 per cent return). Thus $w = 35$ and, at $50 annual gross premium, the 100 per cent return, before claims, equals $1,750. To exhaust this entirely by claims, 17.5 months of benefit must be paid. Again, we will assume claim continuance according to the 1964 CD Table.

Exhaustion by a single claim is unlikely. Table 2 shows the quinquen-

nial central age probabilities. It will be evident that a single claim is unlikely to exhaust the return benefit. The most likely probability, however, is that five claims will be incurred over the full thirty-five-year renewal period of the policy. The probability distribution as to number of claims incurred is interesting. An approximate calculation of this is shown in Table 3.

TABLE 3

No. of Claims	Probability	No. of Claims	Probability
0	0.00285	6	0.16841
1	.01816	7	.12704
2	.05621	8	.08092
3	.11255	9	.04418
4	.16393	10	.02092
5	0.18503	11 or more	0.01990

The method employed in computing this approximate distribution was as follows:

1. From Table A1 (in Appendix), we can calculate the approximate probability of no claims for thirty-five years as $\Pi(1 - r)^5$ = product of the seven values $= 0.00285$.
2. The 35th root of 0.00285 is 0.8459, the "geometric average" probability of no claim in any one of the thirty-five years. Hence the "geometric average" probability of a claim in any one year is $1 - 0.8459 = 0.1541$.
3. From this, the probability of exactly 1 claim is, approximately, $0.1541 \times 35 \times 0.00285/0.8459 = 0.01816$; for 2 claims, $(0.1541)^2 \times 35 \times 34 \times 0.00285/0.8459^2 = 0.05621$; and so forth.

Again, short of an elaborate computer simulation technique, we must adopt some rough and ready estimate,[1] and it does not seem unreasonable to assume that the claim cost for nine months of benefit, about one-half of the one claim return-premium exhaustion level, is a fair estimate for S', the portion of the total claim cost that is applicable directly toward reduction of the terminal return benefit. Under this assumption, the total return, before claims, of \$1,750 is reduced by \$759, which is the value of

$$\sum_{x=30}^{64} S_x^{7 \text{ days/9 months}} .$$

Using the values of ${}^{35}Z$ and ${}^{35}D$ developed in Section I of the Appendix, we may now compute L for these trial assumptions:

$$L_{30} = \frac{198[35 \times 40 - 759]}{(68{,}661 \times 0.6) - (35 \times 198)} = \$3.70 .$$

[1] For another discussion of methods of calculating values relating to multiple claims, see the Part 10I Study Note, "Risk Theory," by John C. Wooddy.

Thus our assumption of \$10 for L_{30} was considerably too high. If we check the one claim exhaustion duration against this result, we get $35 \times \$43.70 = \$1{,}529.50$, or 15.3 months of compensable disability instead of 17.5. The difference, particularly in reference to our rough estimate of the claim offset using S' values for nine months, should not be important.

By way of a final check, suppose that we assume no reduction for claims at all—in other words, a 100 per cent return of premium at age 65 to in-force policies regardless of claims. This would produce a maximum limiting cost.

The calculation is

$$L_{30} = \frac{198 \times 35 \times 40}{(68{,}661 \times 0.6) - (35 \times 198)} = \$8.09 .$$

Hence, no matter how inaccurate our estimate of S', the loading cannot exceed \$8.09. Conservatively, then, one might employ a loading of \$5, or 12.5 per cent of the basic premium. This is not a prohibitive loading and suggests that this type of return provision, aside from its weakness as to forfeiture for those policies not persisting to the terminal age, is at least practical as to cost.

Introduction of nonforfeiture provisions.—Actuarially, the problem of extending the return of premium provision to include a nonforfeiture feature is merely an extension of the type of calculation just made, to include valuation of the extra benefit payable upon withdrawal at any duration that has a surrender value.

The additional concept which is introduced here is that of a table of surrender values, which is most simply expressed in the form of a table showing the percentage of cumulative premiums paid to date which will be returned upon withdrawal (lapse or death), reduced by the cumulative claims paid to date. As has been mentioned earlier, it is desirable that the *average* expected surrender values bear a reasonable relation to the asset fund per each in-force return of premium benefit. Note that it is the *average* expected surrender value that should produce this relationship, *not* the maximum surrender value prior to reduction by claims. If the *maximum* no-claim surrender values were equated to the asset fund as of each duration, then the claim offset is being counted twice—once in determination of the asset fund and again by reason of the fact that the maximum value is subject to reduction by any actual claims. Further reference to this important principle will be made later in Section V (on reserves for the benefit).

In this paper no specific attention will be given to the development

of the asset fund. For our purpose here, we will simply assume a scale of surrender values which is presumed to bear a reasonable relationship to the underlying asset fund. It should be pointed out, however, that this fund and the associated scale of surrender values will NOT be closely related to the *normal* policy reserve that develops under a health contract. The normal reserve pattern is similar to that of a term to age 65 life policy. Presence of the contingent termination benefit, however, under the policy with a return of premium provision, introduces an additional element which is in the nature of a terminal pure endowment, so that the reserve pattern will more closely resemble that of an endowment at age 65 policy.

In the example development of the values, which appears as Table A4 in the Appendix, it is assumed that the first surrender value appears at duration n, assumed illustratively to be the fifth anniversary. At this

TABLE 4

Duration m	Benefit Duration (Months)	Duration m	Benefit Duration (Months)
5	0.20	25	4.5
10	0.75	30	7
15	1.6	35	9
20	3		

initial point, it has a value of 10 per cent of the five years' premiums paid to date. From there the percentage gradually increases until it finally reaches 100 per cent at contractual termination at age 65.

A second matter of special concern is the determination of the S' values, that is, those portions of the claim costs which are directly applicable to reduction in the return benefit, representing claim payments which are not in excess, cumulatively, of the return amount as of each duration. We will employ estimates of these values derived at each fifth anniversary, in a manner similar to that used in the preceding computation of L for a policy with a terminal return of premium benefit only. The intervening annual values are then obtained by interpolation on these quinquennial values.

Thus the method consists of estimating the equivalent benefit duration which may be used to calculate S', so as to give it the approximate value required to cover that portion of the claims which does not exhaust the return benefit. The values of this equivalent claim duration which are assumed, in the example development, at each fifth anniversary are shown in Table 4.

These values are derived in relation to assumed trial values of the

return premium amounts at each fifth duration m, which assume a basic premium of \$40 per \$100 monthly income, and a value of the gross return of premium loading, L, equal to \$10. These trial values are shown in column (8) of the sample development in Table A4 of the Appendix.

As to the formula for computing L, let

^{m}y = Return of premium fraction at each duration m;
n = First anniversary at which a surrender value exists (we assume the fifth);
$^{m}W = (^{m}l - {}^{m+1}l)v^{m}$, so that ^{m}W represents the present value of \$1 per each withdrawal (as lapse or death) computed as of the mth anniversary (in the example development, these values are obtained from the same persistency and discount assumptions originally illustrated in this paper);
G_x = Assumed basic policy premium (\$40) at issue age x;
$S_z^{(m)}$ = Value of S', the claim-reduction factor, relating to any policy duration m and attained age z;
k = Net return of premium-loading factor or loading "loss ratio" (again, for the example development, we assume 0.6);
^{w}Z = Same meaning and value as in the other illustrative calculations.

Then the value of L_x, for any issue age x, is given by the formula

$$L_x = \frac{\sum_{m=n}^{w} {}^{m}W\left[m\,{}^{m}y \cdot G_x - \sum_{s=x}^{x+m-1} S_z^{(m)}\right]}{{}^{w}Zk - \sum_{m=n}^{w} {}^{m}W \cdot m\,{}^{m}y}. \tag{5}$$

The development of the various terms required for the computation is shown in Table A4 of the Appendix, for issue age 30. The calculation yields a value for L, the loading, of \$11.11, quite close to the trial assumption of \$10. This is 28 per cent of the assumed basic premium of \$40, which seems a practical level of cost.

E. *Summary Comments on Cost and Design of a Satisfactory Return of Premium Provision*

At this point it will be useful to summarize the merits of the various types of return of premium provisions in relation to the following basic considerations: (1) cost, (2) equity, and (3) compatibility with purpose and function of the basic insurance.

As I stated at the beginning of this paper, I do not believe that such criticisms as "discrimination" and "sick subsidizing the well" represent

really valid, defensible objections to the provision, any more than they would in relation to an endowment life policy as compared to a term life policy. The return of premium provision should be analyzed as a specific benefit, subject to clearly defined contingencies, purchased by a fair and proper premium paid by all who elect to buy it. The notion that occurrence of the various different contingencies involved will "separate" the policyholders into "discriminatory" classes of "sick," "well," or otherwise is an illogical and dangerous idea, which should be discarded in favor of the far sounder and actuarially logical concept of equity.

The "no claims" provision, as I have shown, is one that develops a practical and reasonable level of cost for coverage involving a sufficiently high probability of claim. Its cost may reach prohibitive levels for coverage involving a low claim rate. Far more serious criticisms of this provision, however, are the two facts that (1) it is acutely inequitable and (2) it naturally operates to discourage the submission of legitimate claims and is thus thoroughly incompatible with the purpose of the basic insurance.

The "percentage claims" provision, which most commonly allows claims up to 20 per cent of cumulative premiums, can become prohibitively expensive and is thus of doubtful practicality in relation to coverage with a considerable probability of small claims. Since the cost of return of premium may become prohibitive in any case under plans of coverage with low claim rates, it seems doubtful that this type of provision can be generally provided at a practical level of cost. Furthermore, it represents little improvement over the "no claims" provision so far as equity and compatibility are concerned.

"Rolling n-year cycles," as has been shown, can add significantly to the cost in comparison with fixed n-year cycles—so much so that, once again, the cost may be driven to prohibitive levels. And, when used with either the "no claims" or "percentage claims" provision, the criticisms of inequity and incompatibility remain.

Percentage return at contractual termination, reduced by any claims, generally becomes more reasonable as to cost, at least at younger issue ages where a fairly long interval of years exists between issue and termination. This provision is also compatible with the basic purpose of the insurance, since it does not operate to discourage claims. The criticism of inequity remains, however, except that, the cost being lower to begin with, there is less *quantitative* inequity to be concerned about. In general, this provision would appear to be considerably less objectionable than "no claims" or "20 per cent claims" provisions operating on n-year cycles, either fixed or rolling.

Finally, percentage return upon termination—reduced by any claims, whether termination is contractual or is the result of prior lapse or death—thus providing an element of nonforfeiture, can be quite reasonable as to cost, at least, again, at younger issue ages. No sample calculations have been shown in this paper for older ages, but even here the cost can be kept within reason if the percentage scale of return, at or above a given issue age, stops short of 100 per cent as of contract termination.

Further, this provision is equitable, since a reasonable element of nonforfeiture is built in and since there is no abrupt claim level cutoff on the return benefit, as there is with a "no claims" or "20 per cent claims" provision. Nor does this provision conflict with the basic purpose of the insurance, there being no inherent discouragement of legitimate claims. Thus, a provision of this general type adequately satisfies the three basic considerations that we have established.

The contention is sometimes advanced that a health contract surrender value should be payable regardless of claims. This situation, however, would be precisely parallel to payment of the cash value in addition to the death benefit, under life insurance. Such a contention, if advanced as a mandatory requirement, is thus a result of fallacious reasoning, similar to that which leads to the comparable specious arguments frequently advanced against cash value life insurance. If such an independent surrender value is provided, it materially increases the cost, as is true in life insurance where the cash value is payable in addition to the death benefit.

There is another important advantage in a provision under which the return benefit is reduced by any claims paid. If the incurred claims have exceeded expected levels, which can certainly happen under both disability and medical coverage, then the return provision operates as a partially compensating safety valve. A similar principle operates in endowment life insurance, where a carrier may issue to a substandard risk that would be declined for term coverage. Thus, under the health contract, higher claims generally mean reduced return premium liability. If claims have materially exceeded expected levels, for example, under a medical policy as a result of inflation, then the policyholders have enjoyed a bargain in relation to the premiums they have paid. A return of premium benefit that is reduced by any claims paid can thus operate as a stabilizing factor, mitigating the degree of inadequacy in the premium structure. On the other hand, a policyholder who could surrender his policy for unreduced return after having already been paid claims perhaps far in excess of all premiums paid would seem to be profiting unduly from premiums contributed by others. Reduction of the return benefit by claims paid thus operates as an equitable and stabilizing factor.

Another notion sometimes advanced is that nonforfeiture provisions should be made generally mandatory in health insurance contracts. It would be regrettable if this should ever happen. The increase in cost is considerable, and adequate health insurance is costly enough already without introducing mandatory nonforfeiture provisions. However, as a solution to the magnified problem of reasonable equity that develops whenever a return of premium provision is incorporated into a health contract, an element of nonforfeiture appears to be essential. Thus the practical optional alternatives available ought to be contracts entirely without any return of premium, surrender value, or nonforfeiture element, on the one hand, or else contracts optionally incorporating both surrender value or return of premium and a nonforfeiture element, on the other. The popularity of the return of premium concept appears to be establishing itself quite well in the market place, and *satisfactory* versions of the provision should be *optionally* permitted.

There is a variety of other questions and problems that arise in connection with return of premium benefits. One interesting item is the question of preserving adequate claim records. Many companies destroy old claim files after five to ten years, but under a return of premium provision, especially the type providing return upon contractual termination, it would seem that adequate claim records would need to be maintained throughout the life of the contract, in order to resolve any controversy as to what net return the policyholder is, in fact, entitled.

Similar considerations relate to the premium history. Is the return to be calculated on the annual mode only or on the cumulative actual total of premiums paid? What about reinstated policies, if the full amount of back premium were not to be collected? What about a return of premium provision on a family medical contract where the persons covered and hence the premium vary from time to time? Should "contractual termination" operate in respect to each person covered or only in respect to the contract itself?

Another very significant characteristic of return of premium benefits, for which specific periodic review and testing procedures must be set up, is the fact that the liability is 100 per cent deferred for a period of years and then emerges quite precipitously. Because of this characteristic of the provision, a company could possibly go along blithely for a considerable period, utterly unaware that it is in grave trouble. Unless interim tests of the assumptions employed are carried out, a carrier with inadequate rates or emerging trends which are unfavorable to its return of premium experience may not realize that disaster is in the making. Accordingly, care-

fully supervised actuarial tests at periodic intervals *well in advance* of pay-off anniversaries are critically important. At such times, the claim experience and the persistency experience to date must both be very carefully checked if shocking surprises are to be avoided. Needless to say, an even more important precaution is that the pricing of the return provision be prudently and competently carried out originally.

Comment has been made, but no specific attention has been given, in this paper to such actuarial problems as antiselect lapsation, or, perhaps, antiselect persistency. It has not been the purpose of this paper to investigate these problems, other than to call attention to their potential effects. Our purpose here has been, instead, to develop various aspects of general actuarial theory and method relating to return of premium.

There remains one final major topic of consideration: the question of policy reserves relating to return of premium benefits.

IV. RESERVES FOR RETURN OF PREMIUM BENEFITS

Reserves for return of premium benefits involve certain special considerations. The necessary values could possibly be incorporated into the reserve factors employed for valuation of the basic policy benefits, but this is probably inadvisable for several reasons:

1. The elimination period (or the deductible) is not usually a highly critical factor in the regular valuation of policy reserves. Accordingly, many companies employ a grouping process for this purpose; for example, all policies with thirty-day or shorter elimination periods may be grouped and valued on fourteen-day reserve factors, while all longer elimination plans are valued on ninety-day factors. But, as we have shown, under return of premium benefits the elimination period is a hypercritical element, so such grouping is generally not practical.

2. Basic policy reserves on disability benefits are not usually separately determined by occupational class or even sex. But, again, these factors may be critical with respect to return of premium and therefore may need to be separately taken into account.

3. The customary unit of $10 or $100 monthly income, in the case of return premium on disability benefits as an example, may or may not be a convenient unit for return premium reserve valuation. Frequently, the most convenient unit will be, say, $100 of total policy gross premium, including the return premium loading.

4. Since no return benefits can be incurred during the first n policy years, a question arises as to whether the two-year preliminary term basis (if this is being used for the basic reserves) is appropriate for return of premium reserves. It may prove advisable to employ a one-year preliminary term basis. Thus the nature of the benefit involved may lead to a different basis altogether from that used for the basic reserves.

Accordingly, we will here deal with return of premium reserve valuation as a separately determined liability. If we approach the necessary formulas in the customary manner, we can readily construct them by proceeding in a manner similar to that employed earlier in the paper in the construction of gross premium loading formulas.

As an example, let us develop the appropriate formulas for the "no claims" n-year rolling cycle provision, for which example gross premium factors are developed in Table A2 of the Appendix. Employing an equivalent notation for the auxiliary probability factors, we have the same formulas for

$$ {}^{n}_{m}X^{e}_{x}, \qquad {}^{n}_{m}(X)^{e}_{1,\,x}, \qquad {}^{n}_{m}(X)^{e}_{2,\,x}, \qquad \text{and} \qquad {}_{w,\,m}{}^{n}Y^{e}_{x}, $$

as in formulas (2a), (2b), and (2c).

For net annual premiums, let us adopt the Greek letter equivalents of the gross loading symbols used previously. These are shown in Table 5.

TABLE 5

	Gross Loading	Valuation Net Annual Premium	Valuation Net Single Premium
Dollar value per benefit unit.....	L_x	Λ_x	A_x
Value per each \$1 G_x.....	p_x	π'_x	a'_x
Value per each \$1 of (G_x+L_x).....	.....	π_x	a_x

We adopt this particular choice of π and a notation since, when working with a gross premium unit for valuation, $G_x + L_x$ rather than G_x only will usually be the more convenient basis.

Let us further define the following special commutation function:

$$ {}_{m}N_x = N_x - N_m, \tag{6} $$

N being the familiar function used for net valuation purposes in place of the gross premium function Z that we have used previously. Also, we will here use the regular function D_x, based on age, rather than ${}^{m}D$, based on duration.

For valuation usage, let us also use t to indicate the terminal age, in place of w, the terminal duration, which we have employed in the preceding gross premium formulas.

We then obtain the following net annual and net single premium formulas (7)–(9) (see p. 258).

Net Annual

$$ {}^{n}_{t}\Lambda^{e}_{x} = \frac{{}_{t-x,\ n}{}^{n}Y^{e}_{x}\cdot yn(G_x + L_x)}{{}_{t}N_x}, $$

$$ {}^{n}_{t}\pi'^{e}_{x} = \frac{{}_{t-x,\ n}{}^{n}Y^{e}_{x}\cdot yn(1 + {}_{t-x}{}^{n}p^{e}_{x})}{{}_{t}N_x}, $$

$$ {}^{n}_{\cdot}\pi^{e}_{x} = \frac{{}_{t-x,\ n}{}^{n}Y^{e}_{x}\cdot yn}{{}_{t}N_x}, $$

Net Single

$$ {}^{n}_{t}A^{e}_{x+m} = \begin{cases} \dfrac{{}_{t-x,\ n}{}^{n}Y^{e}\cdot yn(G_x + L_x)}{D_{x+m}} & (m < n) \\ \dfrac{{}_{t-x,\ m}{}^{n}Y^{e}_{x}\cdot yn(G_x + L_x)}{D_{x+m}} & (m > n)\,. \end{cases} \tag{7} $$

$$ {}^{n}_{t}a'^{e}_{x+m} = \begin{cases} \dfrac{{}_{t-x,\ n}{}^{n}Y^{e}_{x}\cdot yn(1 + {}_{t-x}{}^{n}p^{e}_{x})}{D_{x+m}} & (m < n) \\ \dfrac{{}_{t-x,\ m}{}^{n}Y^{e}_{x}\cdot yn(1 + {}_{t-x}{}^{n}p^{e}_{x})}{D_{x+m}} & (m > n)\,. \end{cases} \tag{8} $$

$$ {}^{n}_{t}a^{e}_{x+m} = \begin{cases} \dfrac{{}_{t-x,\ n}{}^{n}Y^{e}_{x}\cdot yn}{D_{x+m}} & (m < n) \\ \dfrac{{}_{t-x,\ m}{}^{n}Y^{e}_{x}\cdot yn}{D_{x+m}} & (m > n)\,. \end{cases} \tag{9} $$

As before, y is the fraction of cumulative premium to be returned at the end of the n-year cycle.

From any of these expressions, the usual prospective formula for the terminal reserve is easily stated; for example, for the reserve per \$1 of $(G_x + L_x)$:

$$ {}_mV_x = a_{x+m} - \ddot{a}_{x+m:\overline{i-x-m}|} \cdot \pi_x . \tag{10} $$

Since no benefits are incurred until the end of year n, it may prove convenient during the first n-years to employ the following simple retrospective formula:

$$ {}_mV_x = \frac{{}_mN_x \cdot \pi_x}{D_{x+m}} \qquad (m < n) . \tag{11} $$

The reserve for an n-year rolling cycle provision will develop a characteristic "sawtooth" pattern. As an example, if we develop terminal reserve values for the same example benefit for which values are developed in Table A2 of the Appendix, we obtain the following, using 1958 CSO $3\frac{1}{2}$ per cent mortality and interest with the 1964 CD Table. The only change in the computation of the auxiliary X values will be substitution of the 1958 CSO $3\frac{1}{2}$ per cent D values for the ${}^mD$ values in column (4) of Table A2. The terminal values shown are those standing just prior to payment of any return premium then due and are on the per \$1 of $(G_x + L_x)$ basis. $\pi_{30} = 0.3008$.

$$ \begin{aligned} {}_{10}V_{30} &= 3.586 ; \quad {}_{20}V_{30} = 1.837 ; \\ {}_{11}V_{30} &= 1.208 ; \quad {}_{21}V_{30} = 1.376 . \\ {}_{12}V_{30} &= 1.249 ; \end{aligned} \tag{12} $$

Because of this "sawtooth" pattern, use of mid-terminal reserve factors must be applied with considerable care. A routine calculation of mid-terminal values could materially understate the true liability on business approaching the first n-year return benefit date, particularly, and this possibility should be studied before the actual reserve valuation procedure is put into operation.

A. *Reserves for the Percentage Return at Contractual Termination Provision, with Nonforfeiture Feature*

While some reasonable level of lapse-rate assumptions can be actuarially justified in the case of health insurance policy reserves for benefits

which contain no nonforfeiture provisions, neither a lapsation nor a mortality decrement is appropriate to reserve accumulation on a benefit incorporating nonforfeiture, at least in the theoretical case of a benefit where the average expected withdrawal payment is equal to the reserve. The elimination of the mortality decrement as well as the lapse decrement may appear at first to be strange, but the validity of the principle becomes obvious when one considers the fact that withdrawal as a result of death, if no death benefit as such is involved, is actuarially identical to the circumstance of withdrawal through lapse. If the two are precisely equivalent as to their actuarial effect, obviously there is no validity in treating the two types of decrement any differently in the determination of the reserve. The reserve therefore becomes a zero decrement accumulation and is precisely the same thing as an annuity certain sinking fund. If mortality decrements were taken into the accumulation, this would amount to the erroneous assumption that reserves released on death would be available to fund the reserve accumulations on surviving policyholders.

There is a second, and even more important, peculiarity of the reserve in relation to withdrawal benefits which are subject to reduction by prior claims. The reserve (or, more properly, the asset fund) should bear a reasonable relationship not to the withdrawal benefit prior to reduction by claims but to the average expected withdrawal benefit actually payable after reduction by claims. How then does one determine the proper level of the "maximum withdrawal benefit" prior to reduction by claims? This is done by relating the unreduced schedule of withdrawal benefits to the asset fund accumulation required to fund a terminal benefit equal to the full amount prior to reduction by expected claims.

For example, suppose that 100 per cent return of premium at age 65 on a given contract would equal $5,000. On the other hand, suppose average expected cumulative claims, as of age 65, would equal $2,500. Then, if we assume that an annuity certain sinking fund, reduced by a reasonable surrender charge, is considered equivalent to the asset fund accumulation, the successive yearly levels of such a fund, accumulating a series of annuity certain payments to a final level of $5,000 as of age 65, should be taken as the schedule of increasing maximum withdrawal benefits prior to reduction by claims. The actual reserve carried on the benefit, however, should be based on an annuity certain sinking fund accumulating to $2,500 as of age 65.

Calculation of two different levels of fund is therefore necessary—one

level for the actual reserves and a higher level for the schedule of maximum withdrawal values. The sinking fund values for the maximum schedule in the above example (prior to reduction by the amount of surrender charge) could perhaps be exactly 200 per cent of the reserve values, with both accumulating on a one-year preliminary term basis. As a practical matter, however, general asset fund considerations lead to the view that the maximum schedule sinking fund should probably be on a longer preliminary term basis, such as five years, using the longer preliminary term approach as an alternative to a specific surrender charge. Thus the maximum value sinking fund might well accumulate following a five-year preliminary term, while the actual reserve accumulates after a one-year preliminary term.

It is interesting to note that there is another close parallel between the increasing maximum withdrawal value, in health insurance, and increasing cash values in life insurance, in that both lead to the concept of a reducing "net amount at risk." The health "net maximum amount at risk" might be viewed, for example, as the maximum possible claim under the basic contract, reduced by the current withdrawal benefit payable. The possibility of multiple claims, however, renders this a much less specific concept than is the case in life insurance.

As to the actuarial formulas for the reserve, employing notation consistent with what has been used so far and recognizing the principle that the accumulation is zero decrement, we have the following formulas for net annual premiums and reserves:

Net Annual Premium Reserve

$$ {}_t\Lambda^e_x = \frac{v^{t-x}\left[y(t-x)(G_x+L_x) - \sum_{z=x}^{t-1} S'^e_z\right]}{\ddot{a}_{\overline{t-x}|}}, \qquad {}_mV_x = \ddot{S}_{\overline{m}|}\cdot {}_t\Lambda^e_x \tag{13} $$

(for the dollar value per benefit unit version)

$$ {}_t\pi^e_x = \frac{v^{t-x}\left[y(t-x) - \sum_{z=x}^{t-1} \frac{S'^e_z}{G_x+L_x}\right]}{\ddot{a}_{\overline{t-x}|}}, \qquad {}_mV_x = \ddot{S}_{\overline{m}|}\cdot {}_t\pi^e_x \tag{14} $$

(for the value per each \$1 of $[G_x + L_x]$).

Sometimes the benefit unit formula will prove more convenient and at other times the premium unit formula. Here again, it will be seen that,

since S' varies with $(C_x + L_x)$, different factors may become necessary for many different combinations of occupational class and sex as well as specific benefit plan. It is possible that the ratio $\Sigma S'_z/(G_x + L_x)$ may prove to be stable enough so that an average value of this ratio can be used over a range of parameters, thus materially simplifying the construction of reserve factors. Considerable testing, however, would be necessary before satisfactory groupings could be arrived at.

TABLE 6

Duration m (1)	${}_{m-1}V_{x+1}$ (2)	$m^m y(G_x+L_x) - \sum_{z=x}^{x+m-1} S'^e_z$ (3)
5	$ 66	$ 15
10	162	42
15	276	88
20	412	209
25	573	386
30	764	667
35	991	991

Let us carry out one sample development of reserve factors, applicable to the same plan as developed in Table A4 of the Appendix. Here we will use the benefit unit approach (factors per each $100 monthly income).

$$\sum_{z=30}^{64} S'^e_z = \$759\,, \qquad G_{30} + L_{30} \doteq \$50\,,$$

$$y = 1\,, \qquad t - x = 65 - 30 = 35\,,$$

$${}_{65}\Lambda^e_{31} = \$15.08968\,, \qquad i = 3.5\%\,.$$

Table 6 shows the development at quinquennial durations using, for this example, one-year preliminary term reserves. As will be seen, the terminal reserve is substantially in excess of the average surrender value (col. [3]) at all intermediate durations, indicating that the reserve as so calculated is entirely adequate to fund intermediate withdrawal values as well as the final expected average terminal benefit. Further, since the reserve, in this example, is substantially in excess of the average surrender value that it is supporting through the earlier and intermediate durations, this would indicate that either a lower reserve, such as 2 year preliminary term, would be appropriate, or else the scale of sur-

render values should be increased to a somewhat higher level if justified by the underlying net asset share values.

B. *Retrospective Gross Premium Reserve Valuation*

It will be evident that, because of the large number of variables as to plan, sex, and occupational class, a valuation procedure (for benefits *without* nonforfeiture provisions) involving actual terminal or mid-terminal factors constructed as described above can become very cumbersome, requiring a complex array of factors to value a large array of cells. This raises the question of whether a more practical alternative would be to employ a retrospective gross premium, or gross "loading" reserve development. Thus, if k, the present value loss ratio, is, say, 0.7, then 70 per cent of L becomes the net annual premium actually being received for funding the benefit. Accordingly, 70 per cent of the return premium loadings actually collected each year could be funded and accumulated at interest, with actual benefit payments credited against the fund accumulation. Alternatively, a type of preliminary term funding could be employed, commencing the funding for each policy with a net contribution applicable to renewal years only.

While relatively easy to administer, such a retrospective type of fund is not consistent with the usual methods of policy reserve valuation employed in the United States. If used, prudent actuarial supervision would seem to require that the company carry out the type of periodic actuarial testing mentioned earlier in this paper, in order to measure the continuing adequacy of the reserve fund in relation to emerging return of premium liability.

APPENDIX

I. ILLUSTRATIVE CALCULATION OF COST OF "NO CLAIMS" PROVISION WITH ROLLING TEN-YEAR CYCLES (SEE P. 245 FOR DEFINITION OF FUNCTIONS)

Using the first set of assumptions that were employed with formula (1) on page 241, and valuing in relation to a seven-day elimination period, let us value this benefit for issue age 30 accumulating over periods of fifteen, twenty, twenty-five, thirty, and thirty-five years, respectively, the last being the full renewal period of the contract. An assumption must be made as to what is payable at terminal age 65 with respect to persons who are then in an uncompleted ten-year claim-free cycle. Let us assume that a 100 per cent return will be payable on these policies with respect to the number of claim-free years.

The necessary calculations are facilitated by employing an advancing computation that calculates each year's cumulative probability factor from the

year preceding. To illustrate the process, it will be helpful to show the actual arithmetic development. The factors employed in the advancing computation are developed from the rates of claim and of no claim applicable to each quinquennium (as shown in Table A1) where r is the annual claim rate. (Again, for simplicity we will assume the central age rate applies to each year of the quinquennium.)

The values of ${}^{m}D$ for the first ten years are shown on page 242, and the continuation for years ten and later is shown in Table A2.

TABLE A1

Central Age	r	$1-r$	$(1-r)^5$	$(1-r)_x/(1-r)_{x-10}$
32.....	0.116	0.884	0.5398	.....
37.....	.126	.874	.5100	.....
42.....	.137	.863	.4787	0.9762
47.....	.150	.850	.4437	.9725
52.....	.164	.836	.4084	.9687
57.....	.181	.819	.3685	.9635
62.....	0.202	0.798	0.3236	0.9546

As an illustration of the advancing computation of the (X) values, $(X)_2$ for the eleventh year is obtained as follows:

$$ {}^{10}_{10}(X)^{7d}_{1}, \quad \text{for year 10} = 0.5398 \times 0.5100 = 0.2753, $$

$$ {}^{10}_{11}(X)^{7d}_{2}, \quad \text{for year 11} = {}^{10}_{10}(X)^{7d}_{1} \times \frac{(1-r)^{7d}_{42}}{(1-r)^{7d}_{32}} \times r^{7d}_{32} $$

$$ = 0.2753 \times 0.9762 \times 0.116 = 0.0312 $$

(i.e., r^{7d}_{32} and $(1-r)^{7d}_{32}$ are the claim and no claim rates applying to the first policy year, and $(1-r)^{7d}_{42}$ is the no claim rate for the eleventh year).

Entry of the various summation factors above into formula (3) on page 246 then yields the desired results:

$$ {}^{10}_{15}p^{7d}_{30} = 38.48\%, \quad {}^{10}_{30}p^{7d}_{30} = 48.05\%, $$

$$ {}^{10}_{20}p^{7d}_{30} = 44.59\%, \quad {}^{10}_{35}p^{7d}_{30} = 51.36\%. $$

$$ {}^{10}_{25}p^{7d}_{30} = 46.89\%, $$

Evidently it is quite necessary, under these particular assumptions at least, to carry the computation all the way to the thirty-fifth (and terminal) anniversary at age 65, since the loading increases the further we carry the computation.

Note by comparison that our original calculation of ${}^{10}p_{30}^{7d}$ (p. 243) yielded a value of 31.27 per cent. We have also mentioned that, if this computation were carried through a second fixed policy decade, the value *decreases* to 29.94 per cent. The value of the rolling ten-year provision is considerably higher, and, since it is *increasing*, must be carried to the terminal year to yield an adequate loading.

TABLE A2

Year m (1)	Persistency (2)	Discount (3)	${}^{m}D$ (4)	${}^{10}_{m}(X)^{7d}_{1;\,30}$ (5)	${}^{10}_{m}(X)^{7d}_{2;\,30}$ (6)	${}^{10}_{m}X^{7d}_{30}=v[(5)+(6)]\times(4)$ (7)
10...	3,936	0.64461	2,537	0.2753	.....	665
.....	.....	.....	$\Sigma=46,530={}^{10}Z$	.....	.....	.....
11...	3,739	.61391	2,295	.....	0.0312	68
12...	3,552	.58468	2,077	.....	.0304	60
13...	3,375	.55684	1,879	.....	.0297	53
14...	3,206	.53032	1,700	.....	.0290	47
15...	3,046	.50507	1,538	.....	.0283	41
			$\Sigma=56,019={}^{15}Z$			$\Sigma=$ 934
16...	2,893	.48102	1,392	.....	.0299	40
17...	2,749	.45811	1,259	.....	.0291	35
18...	2,611	.43630	1,139	.....	.0283	31
19...	2,481	.41552	1,031	.....	.0275	27
20...	2,357	.39573	933	.0585	.0267	76
			$\Sigma=61,773={}^{20}Z$			$\Sigma=1,143$
21...	2,239	.37689	844	.0064	.0282	28
22...	2,127	.35894	763	.0061	.0273	24
23...	2,021	.34185	691	.0057	.0264	21
24...	1,920	.32557	625	.0054	.0256	18
25...	1,824	.31007	566	.0051	.0248	16
			$\Sigma=65,262={}^{25}Z$			$\Sigma=1,250$
26...	1,733	.29530	512	.0052	.0262	15
27...	1,646	.28124	463	.0049	.0252	13
28...	1,564	.26785	419	.0046	.0243	12
29...	1,486	.25509	379	.0043	.0234	10
30...	1,411	.24295	343	.0128	.0226	12
			$\Sigma=67,378={}^{30}Z$			$\Sigma=1,312$
31...	1,340	.23138	310	.0050	.0236	8
32...	1,273	.22036	281	.0046	.0225	7
33...	1,210	.20987	254	.0042	.0215	6
34...	1,149	.19987	230	.0039	.0205	5
35...	1,092	0.19035	208	0.0036	0.0196+0.2818*	60
			$\Sigma=68,661={}^{35}Z$			$\Sigma=1,398$

* Weighted factor for incomplete claim-free cycles at termination.

II. ILLUSTRATIVE CALCULATION OF COST OF "20 PER CENT CLAIMS" PROVISION WITH ROLLING TEN-YEAR CYCLES

Step 1

Determine the maximum single claim, and the probability of its occurrence, which will not disqualify the benefit. As an example, let us examine the seven-day elimination period disability plan at issue age 30. The amount of the gross premium itself, as we have mentioned, now becomes a factor, so let us assume that the basic gross annual premium is $40 per $100 of monthly income (for, say, a twenty-four-month maximum following the seven-day elimination period). We found that the full loading for the "no claims" provision with a rolling ten-year cycle, under our sample assumptions, was 51.36 per cent, so as a first trial let us assume that 100 per cent will be required for a "20 per cent claims" provision. Then the loaded gross premium will be $80 annually per $100, and over ten years the premiums will aggregate $800 per each $100 of monthly income, and 20 per cent of this is $160, equivalent to forty-eight days of compensable disability.

For simplification of our approximate computations, let us assume that the disability continuance applicable to each policy decade is the average of the 1964 CD central age values for the first and second quinquenniums, respectively. Then, for the first decade after issue at age 30, the probability of claim in any one year is 0.121, and the probability of compensable disability enduring for forty-nine days or longer is 0.020. Hence the probability that any single claim will NOT disqualify the return payment is 0.101/0.121, or 0.835—quite a significant probability.

The probability of a policy's incurring exactly one claim in the first decade (ignoring multiple claims within a single year) is $0.121 \times 0.879^9 \times 10 = 0.3790$, and the probability that a single claim will occur, but not disqualify return, is therefore $0.3790 \times 0.835 = 0.3164$.

Step 2

Let us next estimate the effect of multiple claims. The probability of incurring exactly two claims is $0.121^2 \times 0.879^8 \times 90/2 = 0.2348$. The probability that any one claim is 10 per cent of premiums or less is the probability that the claim will produce twenty-four days or less of compensable disability, and this probability, from the average of the 1964 CD Table values at ages 32 and 37, is 0.076/0.121, or 0.628. Hence the probability that two claims in combination will still not disqualify is something *higher* than 0.628^2, or 0.394. Let us assume a value of 0.500. (Note that this value could be determined precisely, although with considerable arithmetic labor, by evaluating the separate probabilities associated with each successive number of compensable days ranging from 1 through 47).

Thus our estimate of the probability that exactly two claims will be incurred and will also not disqualify return is $0.2348 \times 0.500 = 0.1174$.

The probability of incurring exactly three claims is $0.121^3 \times 0.879^7 \times 720/6 = 0.0861$.

An assumption of 0.25 (one-half the estimated two-claim probability) as the probability that the sum of three claims will not disqualify should be reasonably conservative. This, too, could be precisely calculated by considering all the three-claim daily combinations from 1 through 46, but this would be a very laborious task. Hence our estimate of the probability that exactly three claims will be incurred and will also not disqualify return is $0.0861 \times 0.25 = 0.0215$.

Let us estimate another 0.02 as covering the four claims or more contingencies; so the total probability that claims will be incurred but still not disqualify return, for the first decade, is roughly $0.3164 + 0.1174 + 0.0215 + 0.0200 = 0.4753$.

Similar calculations for the later decades follow:

2d Decade:			
Exactly 1 claim:	$0.144 \times 0.856^9 \times$	$10 \times 0.791 =$	0.2811
Exactly 2 claims:	$0.144^2 \times 0.856^8 \times$	$45 \times 0.400 =$	.1074
Exactly 3 claims:	$0.144^3 \times 0.856^7 \times$	$120 \times 0.200 =$	.0242
		4+ claims =	0.0200
		Total probability =	0.4327
3d Decade:			
Exactly 1 claim:	$0.172 \times 0.828^9 \times$	$10 \times 0.727 =$	0.2287
Exactly 2 claims:	$0.172^2 \times 0.828^8 \times$	$45 \times 0.300 =$	.0883
Exactly 3 claims:	$0.172^3 \times 0.828^7 \times$	$120 \times 0.150 =$	.0245
		4+ claims =	0.0200
		Total probability =	0.3615
Final Quinquennium (Incomplete Decade):*			
Exactly 1 claim:	$0.202 \times 0.798^4 \times$	$5 \times 0.431 =$	0.1765
Exactly 2 claims:	$0.202^2 \times 0.798^3 \times$	$10 \times 0.010 =$	.0021
Exactly 3 claims:	$0.202^3 \times 0.798^2 \times$	$10 \times 0.005 =$	0.0003
		4+ claims =	...
		Total probability =	0.1789

* Here, with only five years' premiums, the number of disqualifying days is twenty-five rather than forty-nine for an entire decade.

Full return of premium will not be paid under these contingencies, because the return will be reduced by the amount of the claims. We will make the simple assumption that the average value of the claims involved is 10 per cent of the aggregate ten years' premiums, so the factor for the percentage return on these policies will be $y - 0.1$, where y is the total fraction to be returned under the provision.

Step 3

To complete our arithmetic illustration, let us now incorporate this additional contingency of 20 per cent or less claims into the development of the rolling ten-year-cycle computation illustrated in the preceding section. An adjustment in those calculations becomes necessary, since we must make a revision for the fact that policies qualifying under the 20 per cent or less claims contingency will receive a return along with those producing no claims at all. The incidence of these various small claims will not be evenly distributed over the decade, but, again, for reasonable simplicity, we will assume an even distribution of incidence among the claim-incurring policies. The total probability of one or more claims during the first decade is $1 - 0.2753$ (0.2753 being the probability of no claims), or 0.7247. Out of this, 0.4753, or 66 per cent, will still qualify for return, so in the development we will assume a reduction in the $(X)_2$ values for the *second* decade, from those we previously calculated for the "no claims" provision, of a uniform 66 per cent. Comparable reductions for the third decade and the final quinquennium are 55 per cent and 43 per cent respectively. In obtaining the following rolling (X') values, we will also adopt the convenient oversimplification that any one policy fell out of qualification, during the preceding decade, all in one year. This, of course, is not true for a multiple claim situation; a policy may have been disqualified on the tenth anniversary by the sum of two claims in the first and ninth years, for example, but still qualify on the eleventh anniversary with 20 per cent or less claims over the second through the tenth years.

We thus obtain the following development, with the (X') and X' values being the factors corresponding to their equivalents (X) and X, except that the primed values relate to policies which qualify for return but having had *one or more* claims that do not aggregate more than 20 per cent of cumulative premium.

In generating the (X') values, we use the decennial values obtained in Step 2, employing interpolations of these values for the rolling ten-year cycles ending at durations intermediate to the decennial anniversaries (see Table A3).

By way of further explanation of the derivation of the values shown above, we have, for example, ${}^{10}_{20}(X)^{7d}_{1,30} = 0.1594$, obtained as follows: From Table A1 the approximate "no claim" probability for the second decade (issue age 30) is $0.4787 \times 0.4434 = 0.2124$. In Table A3 the total probability of qualification for return on the tenth anniversary is $0.2753 + 0.4753$, or 0.7506. The value 0.1594 is 0.7506×0.2124, that is, the probability of qualification on the tenth anniversary times the probability of no claim in the second decade.

Similarly, ${}^{10}_{20}(X')^{7d}_{1,30} = 0.3248$, obtained as follows: The "one or more claims" probability for the second decade is $1 - 0.2124$, or 0.7876, and, as discussed above, approximately 55 per cent of these cases will qualify for return on the twentieth anniversary, or a probability of 0.4327. The total probability, there-

fore, for qualification on the twentieth anniversary *with* one or more claims in the second decade is the probability of having qualified at duration 10, or 0.7506, as developed above, times this factor of 0.4327, or 0.3248.

Similar reasoning and application of the appropriate cumulative "no claims," "claims without disqualifying," or "claims disqualifying" probabilities generate all the other (X) or (X') values appearing in Table A3.

TABLE A3

Year m	^{m}D	$^{10}_{m}(X)^{7d}_{1,\ 20}$	$^{10}_{m}(X)^{7d}_{2,\ 20}$	$^{10}_{m}X^{7d}_{20}$	$^{10}_{m}(X')^{7d}_{1,\ 20}$	$^{10}_{m}(X')^{7d}_{2,\ 20}$	$^{10}_{m}X'^{7d}_{20}$
10...	2,537	0.2753	.....	665	0.4753	.....	1,148
11...	2,295	.....	0.0106	23	.....	0.0184	40
12...	2,077	.....	.0103	20	.....	.0182	36
13...	1,879	.....	.0101	18	.....	.0180	32
14...	1,700	.....	.0099	16	.....	.0179	29
15...	1,538	.....	.0096	14	.....	.0177	26
	$\Sigma=56,019={}^{15}Z$			$\Sigma=$ 756			$\Sigma=1,311$
16...	1,392	.....	.0101	13	.....	.0193	26
17...	1,259	.....	.0099	12	.....	.0191	23
18...	1,139	.....	.0096	10	.....	.0190	21
19...	1,031	.....	.0094	9	.....	.0188	18
20...	933	.1594*+	.0091	149	.3248*+	.0186	305
	$\Sigma=61,773={}^{20}Z$			$\Sigma=$ 949			$\Sigma=1,704$
21...	844	.0060 +	.0130	15	.0123 +	.0268	33
22...	763	.0057 +	.0126	13	.0119 +	.0264	28
23...	691	.0054 +	.0121	12	.0116 +	.0259	25
24...	625	.0052 +	.0118	10	.0112 +	.0255	22
25...	566	.0049 +	.0114	9	.0108 +	.0250	19
	$\Sigma=65,262={}^{25}Z$			$\Sigma=1,008$			$\Sigma=1,831$
26...	512	.0051 +	.0120	8	.0115 +	.0269	19
27...	463	.0049 +	.0116	7	.0111 +	.0264	17
28...	419	.0046 +	.0112	6	.0108 +	.0259	15
29...	379	.0044 +	.0108	5	.0104 +	.0254	13
30...	343	.0770 +	.0104	29	.1850 +	.0249	69
	$\Sigma=67,378={}^{30}Z$			$\Sigma=1,063$			$\Sigma=1,964$
31...	310	.0086 +	.0134	6	.0208 +	.0333	16
32...	281	.0078 +	.0128	6	.0201 +	.0330	14
33...	254	.0072 +	.0123	5	.0193 +	.0327	13
34...	230	.0067 +	.0117	4	.0187 +	.0324	11
35...	208	0.0063 +	0.0112	52	0.0181 +	0.0321	96
	$\Sigma=68,661={}^{35}Z$	+0.2446†		$\Sigma=1,136$	+0.4324†		$\Sigma=2,114$

* The calculation of $(X)_1$ and $(X')_1$ for the twentieth and later years must be based on the sum of all (X) and (X') values for year $m-10$.

† Weighted factors for incomplete cycles at termination.

For the "20 per cent or less claims" provision, the approximate formula for calculating the gross loading p will now be

$$ {}^{n}_{w}p_x = \frac{\sum_{m=n}^{w} [{}^{n}_{m}X_x\, y + {}^{n}_{m}X'_x(y - 0.1)]n}{{}^{w}Zk - \sum_{m=n}^{w} [{}^{n}_{m}X_x\, y + {}^{n}_{m}X'_x(y - 0.1)]n} . \qquad \text{A(1)} $$

For $y = 1$ (100 per cent return), we get, for w of twenty and thirty-five years:

$$ {}^{10}_{20}p^{7d}_{30} = \frac{[949 + 1{,}534]10}{61{,}773 \times 0.6 - \text{numerator}} = \frac{24{,}830}{12{,}234} = 203.0\% , $$

$$ {}^{10}_{35}p^{7d}_{30} = \frac{[1{,}136 + 1{,}903]10}{68{,}661 \times 0.6 - \text{numerator}} = \frac{30{,}390}{10{,}807} = 281.2\% . $$

Remember that our original assumptions concerning claims that would not disqualify were based on the assumption that p would equal 100 per cent, so these results indicate that this assumption was much too low. If we now were to run another approximate calculation, we should probably assume that p will equal about 300 per cent. This is surely a prohibitive level, so we are forced to the conclusion that a 20 per cent or less claims provision paying a 100 per cent return on a rolling ten-year cycle is not practical, because of cost, under the set of assumptions we have used.

What is the cost for an 80 per cent return? Here

$$ {}^{10}_{35}p^{7d}_{30} = \frac{[909 + 1{,}480]10}{68{,}661 \times 0.6 - \text{numerator}} = \frac{23{,}890}{17{,}307} = 138.0\% . $$

Thus, in this instance, our original trial assumption for p of 100 per cent was only moderately understated. A further trial approximation might be tried using a value of 150 per cent.

III. ILLUSTRATIVE DEVELOPMENT OF VALUES FOR COMPUTING COST OF TERMINAL 100 PER CENT RETURN OF PREMIUMS, REDUCED BY ANY CLAIMS, WITH NONFORFEITURE PROVISION (ISSUE AGE 30)

The symbols employed are defined on page 252, and the development is shown in Table A4.

From this, the value of L_{30} is

$$ L_{30} = \frac{(16{,}873.5 \times 40) - 404{,}804}{(68{,}661 \times 0.6) - 16{,}874} = \$11.11 . $$

TABLE A4

Year m (1)	${}^{m}y$ (2)	$m\,{}^{m}y$ (3)	${}^{m}W$ (4)	(3)×(4) (5)	$\sum_{z=30}^{30+m-1} S_z^{(m)}$ (6)	(4)×(6) (7)	Trial Value (3)×($G_{30}+L_{30}$) (8)
5...	0.10	0.50	199	99.5	10	1,990	$ 25
6...	0.12	0.72	181	130.3	17	3,077	
7...	0.14	0.98	163	159.7	25	4,075	
8...	0.16	1.28	148	189.4	35	5,180	
9...	0.18	1.62	134	217.1	46	6,164	
10...	0.20	2.00	121	242.0	58	7,018	$ 100
11...	0.22	2.42	109	263.8	71	7,739	
12...	0.24	2.88	98.6	284.0	85	8,381	
13...	0.26	3.38	89.6	302.8	101	9,050	
14...	0.28	3.92	80.8	316.7	118	9,534	
15...	0.30	4.50	73.6	331.2	137	10,083	$ 225
16...	0.33	5.28	66.0	348.5	156	10,296	
17...	0.36	6.12	60.2	368.4	176	10,595	
18...	0.39	7.02	54.0	379.1	197	10,638	
19...	0.42	7.98	49.1	391.8	219	10,753	
20...	0.45	9.00	44.5	400.5	241	10,725	$ 450
21...	0.48	10.08	40.2	405.2	264	10,613	
22...	0.51	11.22	36.2	406.2	287	10,389	
23...	0.54	12.42	32.9	408.6	311	10,232	
24...	0.57	13.68	29.8	407.7	337	10,043	
25...	0.60	15.00	26.9	403.5	364	9,792	$ 750
26...	0.64	16.64	24.5	407.7	393	9,629	
27...	0.68	18.36	22.0	403.9	424	9,328	
28...	0.72	20.16	19.9	401.2	457	9,094	
29...	0.76	22.04	18.2	401.1	494	8,991	
30...	0.80	24.00	16.4	393.6	533	8,741	$1,200
31...	0.84	26.04	14.8	385.4	574	8,495	
32...	0.88	28.16	13.2	371.7	617	8,144	
33...	0.92	30.36	12.2	370.4	662	8,076	
34...	0.96	32.64	10.8	352.5	709	7,657	
35...	1.00	35.00	198	6,930.0	759	150,282	$1,750
				$\Sigma = 16,873.5$		$\Sigma = 404,804$	

Thus, our trial value of $10 for L_{30} was reasonably close, and we find that, under the assumptions used, the value of L_{30} would appear to be a practical and reasonable amount, here being 28 per cent of the basic $40 premium.

DISCUSSION OF PRECEDING PAPER

EDWIN L. BARTLESON:

The Society is indeed fortunate to have as a member Paul Barnhart, who is not only able to write a paper like this but also willing to devote the many hours it required.

Without going beyond what Paul has said with regard to equitableness or desirability of such provisions, I should like to make some suggestions on contractual provisions and policy reserve requirements.

Policy Provisions

1. *Guarantee of renewability.*—It seems clearly improper that an insurer be permitted the right of nonrenewal in the case of benefits such as these unless accompanied by a contractual obligation, such as that in the unique Georgia law, to return a specified percentage, such as 80 per cent, of the premiums, with such return diminished by any claims paid under the policy. It would be desirable, but not quite so urgent, that such a provision be extended to terminations by death or lapse.

2. *Guarantee of premium rate.*—Even though renewability is guaranteed, it would appear that the exercise of any right to change the premium rate should be accompanied by a return of premium such as that described in paragraph 1 in the case of any policyholder not choosing to pay the increase in premium.

3. *Time limit for filing claims.*—Inasmuch as such a provision would certainly tend to discourage the filing of small claims or of claims which the policyholder anticipated would be small, a policy containing such a provision should be required to have a substantially longer time limit for submission of claims than that permitted in a regular contract.

Policy Reserves

It seems that anticipated lapse rates should *not* be a factor in the determination of minimum policy reserves. This raises what may be an intolerable requirement in the valuation of such coverage. If we assume for the moment that it is permissible and appropriate to use lapse assumptions in the early years, it is obvious that these must be continually reviewed in the light of the actual experience. As a particular block of business approaches the date upon which there is a return of premium benefit available, there should be a determination that the policy reserves are in fact sufficient to meet the accumulation of policy obligations. There is a clear obligation in Canada, and at least an implied one in the United

States, for the actuary to certify that the reserves are sufficient to meet the contractual undertakings of the insurer. While an assumption of no future claims may produce adequate reserves for policies eligible for the return of premium benefit (plus, of course, an additional reserve for the benefit), it is clear that the regular reserves which assume average claim rates are inadequate for policies whose experience has made them ineligible for the benefit. The situation is further complicated if the latter have the right (as they should) to discontinue the benefit with consequent reduction in premium.

W. HAROLD BITTEL:

Mr. Barnhart is to be commended for his forthright presentation of essential principles which he feels should be followed in designing return of premium benefits for inclusion in health insurance contracts. This paper will be very helpful to those of us in insurance departments who have had to struggle with a great variety of such provisions to determine compliance with statutes requiring disapproval of contracts if they contain provisions which are unjust, unfair, inequitable, or contrary to law or to the public policy of the state. It is especially timely because the National Association of Insurance Commissioners has been trying for several years, through a special subcommittee appointed to study this problem, to reach agreement with an industry advisory committee on a set of guidelines for such benefits.

The author sent an advance copy of this paper to my commissioner, and, apparently, to all the other commissioners in the United States, with a covering letter in which he set forth three general principles which he felt should be used by departments in considering the acceptability of such benefits under these laws. While their substance can be found in the text of the paper, the principles were summarized in this letter to the insurance commissioners as follows:

1. To avoid excessive forfeiture of policyholder equity in deferred return of premium or termination benefits, reasonable nonforfeiture provisions should be incorporated into such benefits.
2. Such benefits should not operate in a way that discourages legitimate claims by reducing the benefit by a larger amount than the claim submitted.
3. Return of premium and termination benefits should be considered acceptable if they do *not* operate to discourage claims and if they provide reasonable nonforfeiture guarantees.

It seems appropriate to include in this discussion reference to the problems that arise in the regulation of benefits of this kind by the individual insurance commissioners and their staffs and in the development and adoption by the NAIC of guidelines for the administration of the

applicable statutes, because most actuaries are not aware of these difficulties and of our need for their assistance in such matters. Such cooperation, of course, will be contingent upon general acceptance by responsible persons and insurers of the principles which Mr. Barnhart recommends as being essential for the protection of policyholders and a willingness to stand up and be counted in our efforts to prohibit the issuance of any additional contracts which do not measure up to these standards.

This paper presents a challenge to traditional concepts of such benefits which, I must confess, has been a factor in the current position of the New Jersey Insurance Department on the inclusion of such benefits in health insurance policies. We are in the process of reviewing this entire matter and have noted several very important points which do not appear to have been considered by Mr. Barnhart in his study. One that is mentioned only indirectly in the paper is the need for having this benefit available on an optional basis, preferably by the use of a rider on a regular policy for which a fair and proper premium would be paid by all who elect to buy it. Such a rider or supplemental provision should be separately terminable, but not with any option that would permit the collection of benefits thereunder in anticipation of a substantial claim under the policy.

The most important condition applicable to the sale of such benefits is that they should be attached only to contracts which are guaranteed renewable. This requirement has been included in the proposed guidelines being considered by the NAIC and is the one rule on which there seems to be unanimous agreement. Even this rule may not be sufficient to prevent inequitable situations, such as the period for the determination of a return premium benefit extending beyond the date to which renewability is guaranteed.

The most serious problem that can arise in connection with such policies occurs if and when it becomes necessary to increase premiums on a class basis, as permitted under such contracts without guaranteed premiums. There is always antiselection by healthy lives when such increases become effective, and this would be accentuated if a return of premium benefit is available at that time or shortly thereafter. The obvious remedy would be the elimination of the return of premium benefit at the time the adverse experience developed, but the legality and salability of such a restricted benefit are questioned. In any event, this is a problem that cannot be ignored by an insurance department in its consideration of a return of premium benefit which is to be attached to policies with adjustable premiums.

In addition to these problems, there is the question of the standards to be used for determining the reasonableness of the required nonforfeiture provisions and guarantees. This requirement was included in the principles which Mr. Barnhart has recommended to the insurance commissioners for their use in determining the acceptability of such benefits under the applicable statutes. This, probably, is another matter which will have to be considered by the NAIC in its further study of guidelines with respect to the inclusion of such benefits in health insurance policies. It should be noted that these guidelines, in the versions which have been considered to date, all refer to both cash surrender and other nonforfeiture provisions. The position of the New Jersey Department has always been that any such nonforfeiture benefits should consist of or at least include extended term nonforfeiture provisions in all instances in which they are compatible with the type of benefit included and feasible from an administrative standpoint.

NIELS H. FISCHER:

Mr. Barnhart has again made an important contribution to our literature. His latest paper is a particularly timely one. It is published even as the NAIC is considering guidelines for the benefit, and the author is to be complimented on the excellence of his treatment of the subject.

Improved policy persistency, with all its positive effects, is the essential ingredient of the return of the premium benefit. The important effect of greater persistency is to reduce the net cost of insurance to all policyholders in the aggregate. We all know that a longer average policy duration reduces the expense loading in the gross premium. Furthermore, thanks to the return of premium benefit, the greatest savings inure to the most persistent policyholders.

I believe that we all readily accept the fact that this provision more equitably distributes the net cost of insurance between those who lapse and those who persist. Perhaps more difficult to accept is the fact that paying the additional premium for the benefit is more worthwhile than investing it in a separate account. A simple review of premium rates of the companies who offer the benefit, however, will make it quite clear that the investment yield of the separate account would need to be unrealistically high to produce an equal, and guaranteed, result.

The question of individual equity then arises. A disability income policy can lapse because of death or changing insurance needs, even because of simple ignorance. Therefore, a provision which leads to, and depends heavily on, forfeiture of asset shares by withdrawing policyholders, is undesirable. Mr. Barnhart quite clearly describes the problem.

Such tontine effects, as well as policy provisions which would discourage the submission of claims, should be avoided. The principle of individual equity on termination, however, should be subservient to the principal purpose of encouraging persistency and encouraging the development of desirable new health insurance products.

In describing the process of calculating premiums for a return of premium benefit with a claim reduction feature, Mr. Barnhart very correctly warns that policy persistency may be better for policies with no claim history than it is for those with claims. The following factors are to be evaluated:

1. Proportions of disability claims, by age and policy duration, which terminate in death; these terminations automatically improve the claim histories of persisting policyholders and radically change the theoretical claim offsets in Table 4.
2. The physical insurability of the policyholder after a claim; can he qualify as a standard risk for a cheaper policy? If so, it is to his advantage to lapse and buy new insurance.
3. Does the policy or rider itself guarantee a "new start" after a claim and automatically produce a lapse of the old coverage?

Obviously, the premium-calculation process requires making broad estimates of the effects of these factors. A fairly elaborate model office method is suggested, and I will not comment on the method itself, which is a familiar one to all of us. There are certain procedures, however, needed to assure that proper caution has been taken in assigning values to the unknowns. The first is that at least three different interest rate assumptions be tested. There is a danger that a small variation in investment income can result in a large change in profitability.

It is important that lapse assumptions, including assumptions as to the claim histories of those who lapse, be realistically conservative. This means that the claim histories, or loss ratios, of policyholders who persist to the terminal date should be considerably lower than those who terminate earlier. It is also important to assign realistic values to the probabilities of repeat claims. In the absence of actual data, it may be assumed that the possibility of claim under a policy in any year varies directly with the policyholder's number of prior claims. If, for example, we make the assumption that a policyholder who has already incurred a claim is 20 per cent more likely to have a future claim than one who has not, we obtain the probability of approximately 0.180 that a policy will have no claims at all over the course of thirty-five years. On reflection, this probability seems reasonable and compares with the figure of 0.00285 in Table 3, which the author developed from a polynomial expansion.

A conservative high-persistency assumption also leads me to differ with Mr. Barnhart's premium formulas in an important detail. His formulas for determining the return of premium loading are independent of the premium formula for the policy to which it is attached. The implicit assumption is that policy persistency and percentage expense assumptions will not be affected by the addition of the return of premium benefit. Obviously, those who elect to purchase the return of premium benefit constitute a class of risks with inherently higher persistency than those who do not. This means that the model office should be a calculation of the premium for the entire policy and should incorporate the more favorable persistency and expense assumption. It is not material to the calculation whether the return of premium benefit is a part of the policy itself or a rider to the basic policy. This also means, of course, that adding the return of premium benefit reduces the cost of the basic policy—and, therefore, the actual cost of the return of premium benefit itself is appreciably more than the value assigned to it in the ratebook.

THOMAS J. HUMMEL:

Mr. Barnhart is to be commended for his excellent paper. He demonstrates great skill, as well as courage, in the empirical world of morbidity functions. He also presents convincing arguments in favor of a nonforfeiture provision in health insurance contracts with surrender benefits.

My inquiry is directed to the advantages, if any, to be gained in buying the nonforfeiture contract. Assume that *A* buys the nonforfeiture contract for an annual premium of $51.11 and that *B* buys the contract without a nonforfeiture provision, or return of premium benefit of any kind, for an annual premium of $40.00. (These premiums are taken directly from the paper.) At what interest rate will *B* have to invest his $11.11 to be as well off as *A* at age 65? The answer depends on the amount of claim payments over the life of the contract, as shown in the accompanying tabulation (*A* and *B* are assumed to have the same claim pay-

Amount of Claim Payments	Surrender Benefit at Age 65	Approximate Interest Rate (Per Cent)
None	$1,788.85	7½%
$ 840.00	948.85	4½
$1,400.00	388.85	0
>$1,400.00	< 388.85	Negative

ments). $840.00 is 60 per cent of $1,400 and presumably is the result for the "average" policyholder.

The analogy with an endowment at age 65 policy, as suggested in the paper, is evident. Brief tests of term to 65 and endowment at 65 life insurance nonparticipating premium rates indicate break-even interest rates in the $4\frac{1}{4}$–$4\frac{1}{2}$ per cent range. If you expect a claim (or a high level of claims payments), you will surely buy term insurance. If you are confident that you will stay healthy, you will consider buying an endowment policy.

In view of the lack of interest in life insurance endowment policies, one is prompted to ask why there should be much interest in a health insurance "endowment" policy. The answer is that "cash value" health insurance contracts have already been introduced and accepted in the market place. It is this fact that led to Mr. Barnhart's careful and painstaking investigation.

It may also be suggested that the persistency on cash value health insurance will be better. Whether or not this is true, there is no question that present persistency rates on health insurance contracts are poor. Perhaps the principle encompassed in Mr. Barnhart's phrase "actuarially logical concept of equity" should be brought to bear on the problem of poor persistency.

Would level commission scales help? They would have to be industry-wide, and this fact may have antitrust implications. I hasten to note that I am not suggesting any reduction in agents' total compensation; rather, the salary-commission proportions would be adjusted. But it should be comforting to the conscientious agent to know that much of the incentive to replace a policy in his company by a policy in another company has been removed.

Some younger actuaries, in step with the times, are struggling with an identity problem. "What is an actuary?" they ask. I am intrigued with the "actuarially logical concept of equity" and suggest that this is a good place to start in answering the question. Mr. Barnhart demonstrates an application of the concept in his paper. Actuaries need not limit their application of the concept to their own companies but could apply it to their profession, to the industry, and to society at large—indeed, wherever and whenever poor conditions of equity appear.

I will end this discussion where it began, by commending the author for an interesting and provocative paper, and beg his indulgence for using it as a springboard into somewhat unrelated areas.

WILLIS W. BURGESS, JR.:

There has been considerable interest in this type of benefit over the past several months. This interest was generated by the June 14, 1970, draft of the Industry Advisory Committee to the NAIC Accident and Health Insurance with Cash Surrender or other Non-Forfeiture Value Benefits Subcommittee. Since I am a member of the Industry Advisory Committee, I think it should be interesting and helpful to you if I present the facts regarding the creation of the Committee, the evolvement of its deliberations to date, the current status, and the immediate future plans for this important topic.

At the June, 1967, session of the NAIC, the chairman of the Subcommittee on Health and Accident Insurance, Commissioner Guglielmo of Louisiana, was instructed to appoint a special subcommittee to study accident and health insurance with nonforfeiture benefits and an industry advisory committee to that subcommittee.

The underlying questions which prompted the appointment of the NAIC special subcommittee and the Industry Advisory Committee had been referred to the NAIC Accident and Health Subcommittee by the state of Wisconsin at the June, 1967, session.

In September, 1968, Commissioner Manford of Texas, the chairman of the Special Accident and Health NAIC Subcommittee, requested that the Industry Advisory Committee be provided with such information as might be available with respect to the questions raised in regard to nonforfeiture value benefits in individual health insurance policies. Mr. Van Cleave of the Wisconsin Insurance Department was then contacted in an effort to categorize the problem. Mr. Van Cleave indicated that it was of concern to his department that there have been no definitive guidelines established as to the approval or disapproval of contracts of this nature and that it was his department's hope that such guidelines could be evolved.

On November 21, 1968, an informal delegation of Committee members called on members of the staff of the Wisconsin Insurance Department in an attempt to define further the issues involved, which appeared to be the following:

1. The question of requiring nonforfeiture values in regular individual health insurance policies.
2. Consideration of whether nonforfeiture benefits might be appropriate in policies which contain a savings element in some form.
3. Consideration of whether certain savings elements should be included in accident and health policies.

A meeting of the Industry Advisory Committee was held on May 13, 1969, to discuss the issue involved. At the meeting, Jarvis Farley was elected chairman; he presented for consideration a draft report, which was designed to define issues and provoke comment. The draft report categorized health insurance policies by dividing them into various types and then discussed the benefits included in the various types and whether or not, under the individual types, nonforfeiture benefits should be required or permitted.

In the report and in the discussion of it, and in subsequent reports and discussions, several questions have been asked of the Committee that are of significant importance to the health insurance industry. Several such questions follow:

1. Are there types of health insurance policies for which some form of nonforfeiture provision should be required? The Committee appears to be in general agreement that some form of nonforfeiture provision should be required for deferred benefits but has not yet agreed on whether nonforfeiture provisions should be required for all such deferred benefits.

2. Should nonforfeiture benefits be permitted at the insurer's option? The Committee appears to be in agreement that such benefits should be permitted.

3. Should the use of any nonforfeiture benefit be restricted to policies which are noncan or guaranteed renewable? The Committee appears to be in agreement on this restriction.

4. Should a savings benefit be permitted in a health insurance policy? The Committee appears to be in agreement that such a benefit should be permitted.

5. Should a return of premium pure endowment benefit be permitted in a health insurance policy? The Committee appears to be in agreement that such a benefit should be permitted.

6. Should deduction of claims be permitted from a pure endowment benefit? The Committee appears to be in general agreement that no such deduction should be permitted, if it has the effect that payment of a present claim could cause the amount of the pure endowment benefit, or any withdrawal benefit associated with such benefit, to be reduced by more than the amount of the present claim payment. It has not yet agreed, however, on whether such a requirement should apply to all such pure endowment benefits.

On June 10, 1969, an interim report was prepared and mailed to Mr. Manford. The interim report incorporated the recommendations that could be made by the Committee at that time but pointed out that certain questions would require more discussion. The recommendations made follow:

1. A non-forfeiture provision should never be required with respect to any benefit of Type I (Conventional Accident and Health benefits payable if an event involving a morbidity risk occurs or commences during the premium-paying period).

2. A non-forfeiture provision should not be required where the accumulation of funds is based on a pure endowment.
3. A policy which is not non-cancellable or guaranteed renewable should not contain a deferred benefit, and no provision in the nature of a non-forfeiture provision or withdrawal payment should be used with any such policy.
4. Any non-forfeiture provision or termination payment should provide for payment in the event of death as well as any other withdrawal.

On September 10, 1969, the Committee met and reached full agreement in the following additional points: (1) insurers should not be prevented from experimenting with nonforfeiture provisions in connection with noncan or guaranteed renewable policies and (2) the use of a return premium provision is in the public interest.

A discussion draft report was then submitted to the Special NAIC Subcommittee, and the Industry Advisory Committee and the NAIC Subcommittee had a joint meeting at the NAIC Zone Meeting on September 25, 1969.

It was evident that this draft report would not be acceptable to the NAIC Subcommittee without modification. As a result, the Industry Advisory Committee re-examined the subject, and a report was then prepared and submitted to the NAIC Subcommittee at the NAIC meeting on December 1, 1969. There were two modified recommendations in this report:

1. A specific payment not involving any morbidity risk and payable at a specified time—for example, $1,000 payable at age 65—should require a non-forfeiture benefit. A prescribed minimum standard for such a non-forfeiture benefit was included in the report.

2. There have been instances in which each type of deferred benefit has been subject to reduction by all or a portion of the amount of any benefit payments which have been made under the policy. The Committee felt that no recommendation should be made which would prevent experimentation with such a provision, provided the provision did not have the effect of discouraging the submittal of a claim. Any provision under which payment of a present benefit could have the result of reducing a future benefit by more than the present benefit should be regarded as discouraging the submittal of claims.

In Mr. Barnhart's paper he gives three versions of the return of premium benefit. Version A (100 per cent return with no claim) and version B (80 or 100 per cent return with 20 per cent or less claims) would have been outlawed if the Committee report of December 1, 1969, had been adopted by the NAIC. Despite this potential loss of these benefits, the writers and defenders of these benefits did not take any action to attempt to save them until after the June 14, 1970, draft was presented at the June 14, 1970, NAIC meeting.

The danger was there in the December 1, 1969, report, and, if these individuals had acted promptly after that, they would have had six additional months to build their case. Since the time they began to make their case known, they have been given every opportunity to be heard.

I work for a company that has been writing health insurance policies with return of premium or cash value features for several years. Our premium income for these policies in 1969 was over $5,000,000.

The Industry Advisory Committee and the NAIC Subcommittee had a joint meeting on June 4, 1970. It was evident that the December 1, 1969, report would not be acceptable to the NAIC Subcommittee without modification. As a result, the Industry Advisory Committee re-examined the subject, and the June 14, 1970, draft report was then prepared and submitted to the NAIC Subcommittee at the NAIC meeting in June, 1970. The modified recommendations in this report were the following:

1. If a company provides a non-forfeiture provision in connection with Type I (conventional Accident and Health Benefits), there should be a maximum standard. A prescribed maximum standard was included in the report.

2. All deferred benefits should require non-forfeiture benefits, with minimum and maximum standards. Prescribed minimum and maximum standards for some of the benefits were included in the report.

The full Industry Advisory Committee had not approved the June 14, 1970, draft report, and neither this report nor any subsequent reports should be construed as approved reports.

The NAIC Subcommittee agreed to take under consideration the proposed draft of recommendations for action at the December, 1970, meeting, requested that the Industry Advisory Committee present its position to the Subcommittee on the proposed draft, and agreed that the proposed draft of recommendations should be titled, "Proposed NAIC Guidelines Respecting the Use of Cash Surrender or Other Non-forfeiture Value Benefits in Health Insurance Policies." They asked the Committee to develop minimum standards for all the deferred benefits.

The draft of June 14 triggered activity by the Committee and by other interested parties, and several drafts have been prepared since that time. A meeting was held on September 29 involving the Committee and other interested parties.

The latest draft report, dated November 5, that is now being considered by the Industry Advisory Committee includes the following pertinent points:

1. The minimum non-forfeiture values for deferred benefits are recommended as the 5-year full preliminary term reserves for such benefits and 5% interest.

The rationale here is that a company should recover acquisition costs within

five (5) years and thereafter set aside a level amount each year to provide the benefit, at a realistic interest rate by today's standards.

2. There are three (3) distinct points of view in regard to Version B of the Return of Premium Benefit (80% or 100% Return with 20% or Less Claims) presented in Mr. Barnhart's paper.

a) There should be no requirement for withdrawal benefit if the following conditions prevail: the test interval is not longer than ten (10) years, the insured has the right to discontinue the benefit with reduction in premium, and a new test interval starts whenever the amount of claims is such as to extinguish the benefit;

b) The positive effects justify not requiring a withdrawal benefit when these conditions exist, but do not justify the use of the 20% cut-off; and

c) A minimum withdrawal benefit should be required and no claim payments off-set provision should reduce a deferred payment by more than the amount of the present claim payment.

The rationale of these various approaches is given in Mr. Barnhart's paper.

3. No deferred benefit, nor any provision for withdrawal benefit, should be used in any individual policy of health insurance unless the policy is non-can or guaranteed renewable.

4. A withdrawal benefit may be provided in connection with a Type I benefit (conventional Accident and Health benefit), with a maximum standard equal to any reserve which might properly be held with respect to such benefit. Maximum standards should not be required for the deferred benefits requiring nonforfeiture benefits.

5. A deferred paid-up benefit requires a minimum non-forfeiture value computed on the 5-year full preliminary term reserves for such benefits and 5% interest, reduced by an amount designed to minimize anti-selection near the end of the premium-paying period and after the policy becomes paid-up.

6. Any policy which provides a withdrawal benefit should provide such benefit in the event of death as well.

7. The use of a provision for withdrawal benefits will result in the necessity to maintain a reserve which sets a sound value upon the liability associated with such provision.

I hope that I have been able to give you some insight into the deliberations of the Industry Advisory Committee.

JACOB A. LAZERSON:

We are indebted to Mr. Barnhart for a very timely and comprehensive statement of various considerations relative to the return of premium benefit in health insurance. This matter has been of considerable interest to the Pennsylvania Insurance Department recently, and Mr. Barnhart's article touches on all phases of our recent considerations.

I wish to state that any remarks represent my personal observations

and judgment and do not reflect an official position of the Pennsylvania Insurance Department.

My reply to requests for approval of forms and premiums has been along the following lines:

1. Such coverage is antithetical to insurance indemnification, and the premiums paid could probably be more useful in purchasing additional insurance indemnification.

2. The existence of the return of premium benefit may well lead the insured to withhold legitimate claims, particularly toward the end of the benefit period if he has not previously incurred substantial claims.

3. On termination prior to the end of a benefit period, the insured may well forfeit a substantial reserve accumulation.

4. The language for the benefit should be carefully drawn, so that conditions of eligibility and determination of benefit amount are clear. Also involved in the drafting of the benefit are such items as the effect of an automatic termination, which may result in a truncated benefit period and inclusion of premium return for the rider itself.

5. In the event that the threshold limitation, such as zero, 20, or 25 per cent of claims is passed, serious consideration should be given to a new start for purposes of determining a benefit period. This consideration also includes the area of record maintenance, which is very important to the return of premium benefit, and will involve the keeping of claims and premiums records for a great many years, as well as a constant checking to determine the start of a new period when the claims threshold has been crossed. There may be some problems also associated with lapse and reinstatement.

Since a fixed cycle may involve the insured in paying for a benefit he cannot receive, possibly a rolling cycle should be required, despite increased cost and administration in comparison with a fixed cycle. A rolling cycle will improve persistency, provide greater equity, protect the unsophisticated insured, and lessen antiselection. These aspects have particular emphasis where the return of premium benefit is contained within the policy framework rather than as a rider.

6. Return of premium benefits that provide for payment only if the insured persists to automatic contract termination are extremely inequitable. Such riders should be attached only when the right to increase premiums is not retained.

7. Actuarial calculations with regard to premiums and reserves are difficult to evaluate since such judgmental factors as persistency are very important in these calculations.

The liability in any premium cell for a fixed cycle may be determined

by separating the premium volume into two groups: (*a*) those passing the claims threshold and (*b*) those not passing. Only group *b* need be considered. A discount for persistency and mortality as well as an estimate of aggregate claims within the specified limit must be made.

For valuation of liability at duration (r) from the start of the benefit period (n) at age (x), the basic formula is

$$v^{n-r} \cdot {}_{n-r}p^{w}_{x+r} \cdot \left[f \cdot \left(\sum_{1}^{n} G_r \right) - \left(\sum_{1}^{n} \text{claims} \right) \right],$$

where f is the percentage applied to premiums and $(\sum_{1}^{n} G_r)$ is the total projected gross premiums to be used as a benefit base. The formula is suitable for pricing or valuation. The persistency factor is very important and highly judgmental. A company should use conservatively high persistency factors. $(\sum_{1}^{n} \text{claims})$ depends on the type of coverage involved. "High elimination LTD" will create less offset than, say, major medical coverage.

In view of the many objectionable features of this return of premium benefit, disapproval of all such benefits has been discussed. Many insurance companies, however, believe that this benefit is of considerable interest to the insured, has sales appeal, and promotes persistency. We have therefore concluded that, provided the benefit is on a rider basis, is carefully worded, and the company has given serious consideration to premiums, reserves, and record maintenance, we will approve the benefit if it is presented in such a format. A comparison of our standards for review of the return of premium benefit with those presented by Mr. Barnhart shows that he has covered these areas in excellent manner. There are a few observations:

The example quoted is one which we would not approve because it contains the phrase "provided all premiums falling due on this policy . . . have been paid." We believe that for purposes of eligibility it should be provided only that premiums on the basic form and the return of premium rider have been paid. I am pleased to note that the example does contain a description "upon the completion of any period of less than ten consecutive policy years which terminates. . . ." In many instances this type of language has been omitted where it would be appropriately included.

Mr. Barnhart has mentioned a "discrimination objection." We do not believe the coverage to be discriminatory, and Mr. Barnhart has covered the reasoning very well.

Of particular interest is the section on "Characteristics of a Satisfactory Provision." It is evident, from Mr. Barnhart's analysis, that the 20 per cent threshold is not really much more equitable than the zero per cent threshold, particularly from the point of view of withholding claims to-

ward the end of a benefit period. I feel that some sort of termination benefit related to premiums and claims, which is analogous to the nonforfeiture value in permanent life insurance, is more suitable. Certainly a tontine pure endowment is not a graded nonforfeiture value, so that I am in agreement with Mr. Barnhart that return of premium provisions do not "resemble cash value provisions." A type of cash value has been seen in a few recent submissions which generally provides for a graded percentage of total premiums paid less claims paid as a termination value. We have approved these types of "cash values," at least insofar as this particular aspect is concerned.

Insurance companies are well advised to pay close attention to Mr. Barnhart's comments and analyses with regard to costs, pricing, and valuation. I do not believe that the industry is giving these close actuarial consideration. In fact, it would appear that some companies have entered the market with the return of premium benefit and that there has been a very large degree of copying by other companies without any real regard to individual "actuarial aspects." For example, we see riders which are designed to be attached to all types of health coverage and have a uniform percentage of the base policy as the pricing mechanism. In my judgment such pricing, although rationalized by the companies on a "simplicity basis," is of very doubtful value. The range of such percentages is 25–40 per cent, with 30 per cent being most common. Despite the actuarial and practical warnings cited by Mr. Barnhart and in this discussion, it appears likely that we will have very little effect toward a more thoughtful and analytical marketing of this coverage.

This brings up the question whether certain standards can be imposed, possibly through the HIAA or the NAIC. If a position can be established on what should or should not be permitted within the return of premium format by such a group as the Society of Actuaries, perhaps the national industry and regulatory groups will see fit to formulate operational guidelines. Until that time, differential jurisdictional processing will probably pertain.

CHARLES M. BEARDSLEY:

This paper comes at a most propitious time. The concept of the return of premium benefit in connection with individual health insurance contracts is relatively new and has had no previous exposure in actuarial literature. At the same time, however, a number of companies are offering a variety of policy products which incorporate such a benefit in one form or another. The subject deserves a careful review and has now been probed by a competent student of the theory of health insurance mathematics.

The concerns which I wish to express are related to the practical aspects of the return of premium benefit rather than to the theoretical ones. I believe, in all sincerity, that the unique "satisfactory provision" developed in the paper lacks any particular appeal in the market place. In this regard, the conclusions reached in the paper represent a step backward in what has been perhaps the most refreshing innovation in health insurance for a long, long time.

During the past five years, I have been intimately associated with the development and continuing progress of the return of premium benefit for one client and have served in an advisory capacity to several other companies. The company which I shall mention in this discussion was, to my knowledge, the pioneer in two aspects of the return of premium benefit: (1) the 20 per cent limitation in the type of benefit which the author has described as the "80 per cent return with 20 per cent or less claims" and (2) the use of "rolling ten-year cycles." These concepts were introduced partly for the very reasons mentioned by the author. It seemed quite obvious that a benefit payable only in the event of no claims during each successive period of ten policy years would not gain wide public acceptance. Furthermore, even with a 20 per cent limitation, policy persistency would suffer severely if the insured must wait until the eleventh, twenty-first, or thirty-first policy year before a new ten-year cycle could begin. In addition, management was seeking a product which could be sold at a price which would seem reasonable with respect to the potential benefit.

Our studies indicated that a very acceptable compromise was a plan which provided for the return of 80 per cent of ten years' premiums, reduced by claims not to exceed 20 per cent of such premiums, where a new ten-year period would begin on the policy anniversary following any shorter series of years during which claims were greater than two annual premiums. The decision of management to offer this product has been more than justified by both sales and policy persistency.

This company sold its first return of premium benefit rider in connection with individual noncancellable disability income policies four and one-half years ago. Since that time it has become the fastest-growing producer of individual noncancellable health insurance contracts in the United States. At least 92 per cent of its policies of this form have included a return of premium benefit rider as selected by the insured strictly on a voluntary basis.

It might be of interest to know the primary reasons which motivated management to move with such aggressiveness in developing and marketing this product. These are as follows:

For the Policyowner:

1. An incentive to purchase adequate disability income insurance by overcoming the long-standing objection that "unless I have a claim I lose everything I put into this policy."
2. An incentive to keep the basic policy in force when, at each policy-due date, he faces a decision as to whether to renew his disability income contract or to spend the same amount of money on a more temporal gratification of current desires.
3. A long-range persistency motivation based upon the premise that once a policyholder receives a return of premium benefit he will do everything in his power to keep his policy in force thereafter, regardless of his claim experience.

For the Agent:

1. An opportunity to provide a unique health insurance product designed to motivate the policyowner to provide himself with protection in an adequate amount.
2. An opportunity to make some additional commission earnings.
3. An incentive to remain with his company, provided it keeps alert and treats policyowners on an equitable basis with respect to both regular claims and return of premium benefits as they may fall due.

For the Insurance Company:

1. An opportunity to provide a product which will meet with wide acceptance among policyholders and agents.
2. The financial reward resulting from increased persistency, both of basic policies and of the agency force.
3. A more rapid growth of assets and the opportunity to earn excess interest therefrom, particularly at current high yields.
4. The attraction of new agents.

A policy product which has satisfied these desirable goals in such a remarkable way is indeed unique in the individual health insurance field.

The paper does a real service in pointing out the fallacy of the argument of "discrimination" purportedly applicable to the no claims and 20 per cent claims provisions. Such an argument has been set forth on a number of occasions when return of premium benefits were filed for insurance department approval. The paper then proceeds to assert, however, in a manner which may seem logical to the actuarial mind, that the use of a 20 per cent claims provision will mitigate against the submission of small claims by policyowners. I have heard this thought propounded continually for several years now—primarily from competing companies and from "armchair" theorists. My client company's policyowners, however, do not seem to have come to the logical conclusion which was ex-

pected of them. I have been following this very closely month by month and see no indication, nor any potential trend, that policyowners will act in any way other than that which they have always adopted, namely, to submit a claim to which they feel entitled, no matter how large or small.

Obviously, I can speak only on behalf of one company, but it may be of interest to know that this company unquestionably has considerably more return of premium benefit riders in force currently, of the 80-20 per cent version, than all other companies combined.

The author uses a number of examples in the paper which are designed to illustrate the "inequity" of using a 20 per cent claims cutoff provision. There is another side to this question which he chooses to ignore. It can be shown that a combination of a 20 per cent claims cutoff and a rolling cycle provision—or "restart" provision, as I would prefer to call it—can actually be beneficial to the insured. Let us assume, for example, that a return of premium benefit were designed which contained a provision to restart the cycle if, during any period of ten policy years, claims were to exceed 80 per cent of ten years' premiums. (The fact that this would be considerably more expensive than the 80-20 per cent type of benefit will be considered unimportant for the moment.) If the insured should then incur claims of any amount up to and including 80 per cent of ten years' premiums, but no more, it would be a full ten years before the restart provision would take effect. On the other hand, in the regular 80-20 per cent plan, a fresh ten-year period would start whenever one or more claims exceeded 20 per cent of ten years' premiums. It can well be argued that in such an 80-80 per cent benefit a sizable number of policyowners would be subject to termination or twisting. Either of these would be a most undesirable effect.

In my opinion, the stress given in the paper to the amount of forfeiture incurred by a terminating policyowner, if he should give up a return of premium benefit, is magnified out of proportion. The author leads our thinking in this path by describing how much extra premium would be accumulated on a benefit which comes into being only on policy termination (such as at age 65) and concludes that inequity must therefore prevail on return of premium benefits which operate with shorter periods, such as ten years. Let us look at some facts. Assume, for example, that 30 per cent of the basic policy premium is charged for an 80-20 per cent return of premium benefit rider attached to a basic policy having a waiting period of seven days. The maximum amount of extra collection for this benefit during a period of ten years would equal three annual premiums on the basic policy. If a 40 per cent loading were involved, as suggested by the author, the actual net extra cost would be 1.8 premiums

It should be conceded that, under any circumstances, no withdrawal benefit would be permitted for the first several policy years. Let us say that this were to be four years, for example. We then are talking about a possible forfeiture during the fifth to ninth years. I believe that if you study this carefully, you will come to the conclusion that for many insureds there would be very little more forfeiture involved than if they should purchase participating rather than nonparticipating health insurance policies.

The author's very clear development of formulas for the calculation of return of premium benefit cost is a major contribution. I am concerned, however, that his initial numerical illustrations are based upon the assumption that it is reasonable for the loss ratio on both basic policy and return of premium benefit to be 60 per cent. This would mean that a 40 per cent gross annual premium loading is required for the benefit. My experience indicates that this is much too high a loading percentage for both first year and renewal years and that the numerical results therefore show an unrealistic distortion. It should be noted that, when the k factor is increased to 75 per cent, a striking reduction occurs in the relationship between the cost of the benefit and the gross premium on the basic policy. Even the factor of 75 per cent used for all policy years seems to me to be unduly low. Certainly a number of companies may be operating on a commission scale which would require this type of loading, but any company which has carefully analyzed the return of premium benefit and has sought to provide the product at an attractive cost has had to come to the conclusion that commission scales should be radically reduced and that other annual expenses must be kept to a minimum.

Notwithstanding a number of points of difference between my own views and those expressed in the paper, I would like to indicate several factors which a company should consider in developing a return of premium benefit that is attractive in price but still possesses features to which the insuring public has responded quite enthusiastically.

1. Commissions on first-year and renewal premiums for the benefit should be small in comparison to those on the basic policy. General expenses allocable to the benefit should be controlled as rigidly as possible.

2. Waiting (or elimination) periods should be restricted to a maximum of thirty days. There seems to be a growing trend toward using percentage factors for benefit pricing which increase by the length of waiting period. This is in harmony with the conclusions of the paper.

3. In the final period prior to normal termination of the policy, a grading-down of the benefit formula (based upon the number of years in

the final period) would be preferable to a single reduction such as that mentioned in the paper.

4. In the interest of equity, a death benefit should be incorporated. I would suggest that the amount of death benefit be graduated in accordance with the number of years since the last return of premium benefit, using the same formula as that during the final period before policy termination. Obviously there are other ways to provide a death benefit, such as by using the same benefit formula which would apply at the end of any ten-year cycle.

5. In order to treat policyowners on a fair and reasonable basis, it would seem that a benefit rider would be more desirable than the incorporation of this type of benefit into the basic policy itself. Such a rider should provide for cancellation by the policyowner without affecting his right to continue the basic health insurance policy unimpaired.

6. Before offering such a product, a company should make an adequate study of the reserves which it must maintain in order to make proper provision for the return of premium benefits as they may fall due. The paper stresses that such reserves may be considerably higher than is commonly believed and that a company must not be misled into an overstatement of its gains from operations during the period of benefit premium accumulation.

Let us return for a moment to a consideration of the persistency element, which, in my opinion, is at the heart of the development of the return of premium benefit. Persistency is good from the standpoint of the policyowner, the agent, and the company. Improvement in this factor is highly desirable, especially in the field of health insurance. The paper indicates that 70 per cent persistency the first year, 85 per cent the second year, and 90 per cent the third year "represents rather good health insurance persistency." Unfortunately, this seems to be correct. The amount of literature published on lapse rates for health insurance companies is exceedingly sparse. There is a simple reason for this—most companies experience such poor persistency that the last thing they want to do is to inform their competitors about the results. The Life Insurance Agency Management Association has been able to collect the first- and second-year lapse rates from a number of fine companies, some of which were willing to be identified. Their published results indicate that a 30 per cent first-year lapse rate is good and that a 40 per cent first-year lapse rate is quite common. A year ago I appeared as an expert witness in a trial between two health insurance companies in which one of the points of contention happened to be whether, in fact, the first-year lapse rate of one of the companies was 50 or 55 per cent.

There is an enormous waste of time, energy, and money involved in the sale of policies which do not remain in force. Many companies have made gigantic efforts to improve their persistency but have never met with anything other than temporary success. An entirely new approach has been needed to achieve lasting results. In the company about which I have been speaking, persistency has improved to a point virtually unheard of in health insurance circles.

When a person buys a disability income policy, he usually does not give much consideration to the persistency aspect. Only in rare cases does he buy with the intention of lapsing. But circumstances change. Experience shows that for one reason or another people decide not to keep their coverage or find that they cannot afford to do so. At least they think they cannot afford to do so. Every time a premium is due, a decision has to be made whether or not that premium will be paid. For a person in good health, it frequently is just too easy to lapse, because the chance of disability seems so remote. One deludes himself into thinking how simple it will be to take out another policy when he can afford it. There is a psychological difference here in comparison with life insurance, because death is certain but total disability is not.

It takes a vested interest of some sort to deter a disability income policyowner from easy lapsation. It takes a deterrent such as this over a period of years long enough that one begins to appreciate the true value of his policy and become accustomed to the small sacrifice involved in making his premium payments. This is where the return of premium benefit throws a whole new light on the persistency concept. Many people seem to grasp this intuitively when purchasing the benefit and are grateful for the added incentive which it provides to keep the basic policy in force when they may need it most.

A basic principle which experience has taught me is this: Actuaries should avoid dictating what insurance policies are best for the public. Let me relate a personal experience. In 1955 I constructed a new life insurance contract which was an "actuary's dream." It had just the right proportion of increasing protection during a man's productive years, to which decreasing term insurance could be added if desired; it leveled off for a few years prior to retirement, then decreased during the early retirement years, and became paid up for a little more than the original face amount at age 70. A number of other very attractive benefits were included or could be attached by rider. My associates were enthusiastic about this plan. Home office people co-operated happily in preparing excellent sales literature. I proudly bought the first policy. During the ensuing fifteen years a total of eight other people have likewise been

impressed and have purchased similar contracts. Mine is the only policy still in force.

Take a second example. About three years ago a company selling only noncancellable health insurance submitted for approval in its home state a return of premium benefit rather similar to the 80-20 per cent plan described in the paper. An insurance department official, who had extensive actuarial training, came to much the same general conclusions concerning policyholder equity which the author has set forth. He proceeded to demand extensive revisions and refused approval until the benefit had been so modified that it no longer seemed recognizable. The resulting necessary increase in premium rate and the inability of the agency force to communicate the complicated provisions of the benefit to prospective insureds resulted in such poor sales that the product was soon discarded.

One final comment. It should be obvious that I disagree with the opinion expressed that the 80 per cent return of premium benefit offset by claims up to 20 per cent of premiums should be summarily dismissed and replaced by a benefit which cannot come into fruition until normal termination of the policy at an advanced age. Provision of withdrawal benefits on such a plan, in my opinion and experience, would lead to no noticeable increase in policy persistency. Such a plan has no vitality, no force, no possibility of realization within the not-too-distant future to bring about the real results which led to the formulation of the return of premium benefit in the first place. Can you show me such a long-range product, with or without nonforfeiture values, which has in fact really promoted a heavy increase in sales on a consistent basis and dramatically improved policy persistency? I have not seen one yet.

Many of us feel that one of the greatest potential markets in insurance lies in the field of noncancellable and guaranteed renewable disability income plans. An extremely large number of persons have little or no such protection. Most of those who have bought disability income insurance have not provided for their full needs. They should be aroused into action, but the usual methods which have been employed all these years are not getting the job done. The return of premium benefit, however, when properly designed, carefully administered, and resolutely merchandised can make a breakthrough. It can also be a flop. As with any product, the skill and enthusiasm of the management team make the difference.

On a number of occasions I have advised companies not to introduce a return of premium benefit rider into their portfolios. I had no trouble

coming to this conclusion. They looked upon the benefit as a gimmick which would automatically increase sales and run up premium income overnight. Such companies think of health insurance in terms of "sales" or "policies." They lack the concept that disability income is a bastion against a type of economic death. Only when the return of premium benefit is incorporated into a philosophy of enduring protection will it survive and prosper.

WILLIAM A. HALVORSON:

No one has yet discussed the problem of "what tends to discourage submission of claims." During the 1950's several employers offered retired employees the opportunity to "use up" their group life insurance face amounts for medical expenses. Thus there would be $1.00 paid now for medical expense reduced by $1.00 to be paid at time of death. Very few retirees made use of this option, and it was clear that they preferred to "save" their death benefits. Thus the medical protection offered by this plan was little or no protection at all.

Will return of premium benefits that offset the deferred benefit by $1.00 for every dollar paid in benefits result in a reduced submission of claims? My guess is that it will.

This benefit cannot be justified by comparison with group experience rating refunds. Under group, the employer who receives the experience rating credit has a direct interest in keeping his employees healthy and getting them back to work, and the employees' tendency to submit claims is not affected by the group experience rating formula. If the return of premium benefit is viewed as an individual experience rating formula, it would then no longer be insurance, since insurance involves the sharing of risks by a "class," and I submit that a single person is not a class of insureds.

If the return of premium benefit is a deferred benefit not affected by the claims history of the insured, the benefit is then an endowment, and adequate nonforfeiture legislation already exists.

WILLIAM A. WHITE:

In his recent remarks at the annual meeting of the American Life Convention, New York's Superintendent of Insurance Richard E. Stewart had this to say about the changing role of state insurance departments in their regulation of the industry: "Recent developments will force us [state regulators], and will enable us, to put the prevention of company insolvency in a new perspective and to raise the relative importance of

other regulatory objectives, especially those concerned with market conduct." Our Society's President has been speaking to local actuarial clubs on the topic of "Consumerism," and a frequent question from the floor has been, "Why aren't the insurance departments doing more to inform and protect the consumer?" One way in which we can help the consumer is by seeing to it that his viewpoint is represented in the technical discussions of new products, such as return of premium benefit health insurance. This is the purpose of my discussion. In brief, it asks whether the true nature of this product has been so thoroughly obscured that the consumer cannot be expected to make the "intelligent choice based on a complete disclosure of all pertinent information," which is the primary requisite for effective consumer protection.

Mr. Barnhart has not commented on the social need for or desirability of return of premium benefit health insurance. In speaking of its qualities, he has described it as "interesting" and notes its "popularity . . . in the market place." He has also stated, however, that "adequate health insurance is costly enough already without introducing mandatory nonforfeiture provisions" and would seem to imply that the addition to health insurance of any savings-type benefit, unless completely optional for the purchaser, represents a disservice to the insurance buyer. It is my feeling that the return of premium benefit health insurance policy is deliberately designed to deceive the buyer and to lure him into purchasing a savings-type benefit which he does not understand and probably does not really want.

The popularity of the return of premium benefit policy is based on a myth—the common belief that there is no value received for premiums paid by an individual if he incurs no claims. Any of us who have handled any volume of complaints on health insurance can appreciate the difficulty of explaining the monetary value of protection against a contingency which, fortunately, did not occur. An insurance plan which avoids such an explanation may seem attractive to the insurance company; for the contracts described in this paper, however, the design of the products and the methods by which they are sold take advantage of the no-value myth and encourage the insured to believe that he is, in fact, getting "something for nothing." To this extent, the buying public is not truly exercising the sort of option whose availability Mr. Barnhart recommends—an option to purchase a more expensive form of health insurance with inherent savings elements, where the decision is based on a full disclosure of the nature of the additional benefits and of the available alternatives.

Mr. Barnhart's repeated parallel, comparing the relationship between pure and return of premium benefit health insurance to the relationship between term and endowment life insurance, can be used to identify the savings element in the return of premium benefit health contract. In the same way in which the endowment insurance net premium can be split into two elements—one a level savings element to be accumulated at interest to the maturity value and the other a term insurance premium for the decreasing difference between face amount and accumulated savings—the return of premium benefit net premium proposed by Mr. Barnhart can be split into two elements. The first would be the savings element, to be accumulated at interest to the extent necessary to provide the guaranteed nonforfeiture values, with the remainder accumulated with benefit of interest, mortality, and persistency; the second element would represent pure health insurance with an increasing deductible equal to the accumulated savings elements less prior claims. (The probability of repeated claims, together with the availability of savings elements paid subsequent to a claim to offset claim losses, complicates the comparison somewhat but, in my opinion, does not invalidate it.) Fortunately, for the industry, there are no increasing-deductible health insurance policies generally available to the public, so that a "buy term and invest the difference" alternative is not available for comparative purposes. It is interesting to consider how few of our traditional arguments against the life insurance "buy term and invest the difference" proposal would be applicable in this instance. About the only ones I find pertinent are the "forced savings" and the "tax-free interest build-up" advantages. The "forced savings" argument does not carry much weight if the insured does not realize that he has bought a savings program and if the availability of the savings fund is conditioned on good persistency. As to the tax status of the interest build-up, I gather from Mr. Barnhart's choice of a 5 per cent interest assumption that he feels that the return of premium benefit policy reserves would qualify as "life insurance reserves" for purposes of the companies' federal income tax returns; would he also recommend that the additional premium paid by the insured be deductible to the same extent as his regular health insurance premiums?

Mr. Barnhart's philosophy as to nonforfeiture values seems clear enough, but his examples leave room for misinterpretation. He seems to deplore tontine pure endowment pricing that depends on forfeiture through lapsation and has stated that "it is desirable that the surrender values bear a reasonable relation to the asset fund per in-force policy." Unfortunately, he has then repeated the word "reasonable" in subsequent

illustrations of arbitrarily chosen nonforfeiture percentages. The casual reader might equate "reasonable" with "token" and conclude that any pattern of nonzero nonforfeiture values which produces a desired premium level is "reasonable"; this pattern should thus be acceptable to insurance departments or, at worst, argued on judgmental rather than actuarial grounds. I hope that Mr. Barnhart, in his reply to this discussion, will amplify his definition of a "reasonable nonforfeiture benefit." My preference runs toward the classical actuarial definition of equitable nonforfeiture values: A schedule of amounts or benefits available on termination such that, except for the early durations when unamortized acquisition expenses remain, the termination of a contract by reason of an event other than that insured against will neither benefit nor harm the body of persisting contractholders. This definition supports the practice of having no nonforfeiture values on small asset share term policies where the administrative cost of providing values exceeds the asset share; it is also consistent with the concept that any health insurance nonforfeiture value should include an offset for claims paid, since the nonforfeiture use of the asset share is secondary to its primary use—the payment of claims.

If this discussion appears to be critical of Mr. Barnhart's paper, then the fault is mine for not being clear. Mr. Barnhart has prepared an excellent and thoroughly objective paper on a timely topic. My criticism is directed to the entire concept of return of premium benefit health insurance, with or without tontine financing. From the policyholder's viewpoint, I find it to be without redeeming social importance and marketed on a basis designed to mislead the consumer. I am disappointed that reputable insurance companies, in the interests of larger commissions for agents or greater cash flow for investment departments, can see fit to offer such a product. In order to preserve the peace of mind of my "industry" colleagues who disagree with me, I must point out that the opinions expressed are my own and do not necessarily represent those of the insurance department of my state.

DOUGLAS O. SANDERS, JR.:

Mr. Barnhart's excellent and timely paper on the principles surrounding the return of premium benefit fills a void from lack of technical discussion on a benefit which has become increasingly popular and controversial. Recent debate on the work of an NAIC industry advisory subcommittee appointed to explore these benefits has been emotional, has put some on the defensive, and has been mostly confusing to an uninformed but interested bystander.

Actuaries have traditionally recognized that the safety of a company

and the interests of its policyholders take precedence over considerations of strict equity between classes of policies. Mr. Barnhart's development of techniques for reserving such benefits should be underscored and hopefully considered by all parties involved with these matters.

A possible negative feature in addition to those mentioned by Mr. Barnhart about "no claim" and "percentage claim" types of refund benefits is that a widow or third party to a deceased insured could privately keep a policy in force to obtain eventually the refund of premiums.

Formula (1) for the actuarial cost of a "no claims" provision gives much insight on the elementary nature of refund of premium benefits in general. It is interesting to note that k, the present value loss ratio anticipated in the gross extra premium for the refund benefit, will have a constraint when the nature of the benefit is to refund a portion of the extra premium itself. If interest is assumed to be zero and the group of insureds experience no terminations, then assuming k equal to the probability of an individual having no claims causes the extra premium required to be undefined! Or infinite!

To avoid an infinite extra premium, from formula (1) it is necessary that

$$ {}^{n}Z \cdot k \neq {}^{n}X_x^e \cdot y \cdot n \,, $$

$$ k \neq \frac{{}^{n}X_x^e \cdot y \cdot n}{{}^{n}Z} = \frac{v \cdot \prod_{m=1}^{n} (1 - r^e)_{x+m-1} \cdot {}^{n}D \cdot y \cdot n}{\sum_{1}^{n} {}^{m}D} \,. $$

Assume zero interest, 100 per cent survivorship, and 100 per cent refund of premium ($y = 1$). Then $k \neq \Pi(1 - r^e)_{x+m-1}$ or $k \neq$ probability of no claim. As k approaches $({}^{n}X_x^e \cdot y \cdot n)/Z$, ${}^{n}p_x^e$ approaches infinity.

For specific cases of ${}^{n}p_x^e$ for which Mr. Barnhart has already calculated values from Table 1 when $y = 80$ per cent and $n = 10$, I have calculated the nonpermissible values of k and compared these values with the probabilities of no claim, as shown in the accompanying tabulation. Of

Case	$k \neq$	Probability of No Claim
${}^{10}p_{30}^{7d}$	0.114	0.275
${}^{10}p_{50}^{7d}$	.063	.151
${}^{10}p_{30}^{180d}$	.407	.979
${}^{10}p_{50}^{180d}$	0.374	0.899

course, if interest were assumed zero and survivorship were 100 per cent, the nonpermissible values of k would equal the probabilities of no claim.

Profit and contingency margins should vary according to the rarity of the insured event. Therefore, the k value selected should perhaps vary according to the benefit case involved. Certainly, k should be greater than the nonpermissible value and less than unity.

Absolute rates of disablement, r'_x, should be used instead of competing probabilities, r_x, for determining probabilities of no claims since a conditional probability is involved and survivors are exposed to the force of disablement with no loss in annual exposure due to withdrawal or mortality. Mr. Barnhart did correctly use values of such absolute rates from the 1964 Commissioners Table. He might have emphasized this point. An actuary who derives competing probabilities of claim from his own company's experience may carelessly use these for calculating probabilities of no claim on survivors. Morbidity studies are almost always conducted to obtain absolute rates on the basis of average exposure during the year of experience rather than on the basis of the exposure at the beginning of the year of experience.

The paper was most educational, and I recommend it be on the syllabus of all serious actuarial students of individual health insurance.

HENRY K. KNOWLTON:

In his recent paper Mr. Barnhart attempts first to evaluate the return of premium benefit in its various versions and then to fix a price for the benefit. In evaluating various forms of benefits, Mr. Barnhart repeatedly refers to "extreme inequity," even though the probability of recovery by all policyholders with respect to claims, refunds, or both is equal at time of issue of the policy. If a posteriori equity is to be achieved, there is no need for insurance, as each risk should bear its own cost plus expenses. In fact, if a posteriori equity is to be achieved, insurance itself should be outlawed.

The final conclusions at the end of section II, B, are stated to be "clear and unequivocal objections." These conclusions, at least with respect to the policy providing 80 per cent refund after ten years on a rolling ten-year basis, are, I submit, neither clear nor unequivocal but are in fact Mr. Barnhart's arbitrary opinions.

If the return of premium benefit is regarded as a policy benefit, all insureds at the time of issue have the same probability of receiving that benefit, so the policy cannot be judged inequitable. The fact that the

small claim can tip the balance between 19 and 22 per cent of premium is only significant on an "after the fact basis" so is not significant in judging equity. Without any cash values, the benefit is admittedly somewhat tontine in nature; that is, it inures to the benefit of those who survive for ten years, keep their policies in force during this ten years, and have small or no claims. It seems to me that this is the type of policyholder all of us wish we had more of, so why not be nice to them? If forfeiture by an insured of an equity is to be illegal or immoral, or any other provisions even somewhat tontine in nature are to be classed as immoral or inequitable, then to be consistent we should make the following adjustments in our life products, since these adjustments would be required to achieve after the fact "equity" on the part of a policyholder:

1. On lapse without cash value, or any early lapse for that matter, return to the insured the excess of his premium over the premium that he would have paid for term insurance during the time his policy was in force. After all, he could have bought term insurance had he known he was going to lapse his policy; it would have been much cheaper for him to do so; so if we do not return the difference between the term premium and the premium which he paid, then we are treating him unfairly.
2. Dividend scales on participating policies should be more strictly regulated to insure that the scales are not too steep and are not in fact tontine in nature. In fact, premiums on participating policies should probably be pegged at not higher than the premiums on competing nonpar policies so that dividends would in fact be dividends and not simply a return of an excess premium.
3. Insurers should be required to pay the cash value in addition to the death benefit, since otherwise the insured who dies forfeits his entire cash value.

Needless to say, I do not suggest that we make these changes; I list them only to show the lack of consistency of Mr. Barnhart's conclusions with industry practice.

In addition, if policy provisions which discourage small claims are undesirable, all policy provisions which discourage submission of small claims should be made illegal. It is, to me, entirely absurd to be quite so sanctimonious about policy provisions which discourage small claims in a benefit line which permits cancellable contracts. If anything can possibly discourage submission of small claims, it is fear of getting your policy cancelled for submitting some small claims. Extending Mr. Barnhart's argument to other lines of insurance would require that auto and other casualty coverages be made guaranteed renewable and that health insurance be written only on a guaranteed renewable or noncan basis.

In discussing the characteristics of a satisfactory provision, Mr. Barnhart concludes that an equitable return of premium benefit must incorporate elements of nonforfeiture. If this is true, then the nonforfeiture benefit will be simply another benefit which adds to the cost of the policy and may indeed become more important costwise than the disability benefits labeled as the basic purpose of the policy. Many of us are having this problem with our life policies; that is, cash values have a greater impact on gross premiums than mortality rates. It hardly seems advisable to extend this situation to the health line.

If indeed the health insurance industry is going to have nonforfeiture benefits in its policies, it seems to the writer that these should apply across the board to all health insurance policies and should be based on representative asset shares. This would encompass an approach similar to that used in establishing the standard nonforfeiture law.

Even without the return of premium feature it can be argued that pricing of all health insurance depends on forfeiture to recover additional profit at any time where forfeiture occurs after an asset share exceeds zero. If pricing depending on forfeiture is, in fact, bad, then the same standards should be applied throughout the health insurance line.

In section IV of his paper, Mr. Barnhart states that the actuarially computed cost of a return of premium rider may vary from 10 to 500 per cent, yet the loading on many policies may simply be a uniform 30 or 40 per cent of the basic premium. In evaluating the rate structure of a given company, one must consider both the basic rate structure as well as the rate structure for the return of premium benefit. The company which has, perhaps, the broadest experience with this benefit has basic rates without the return of premium rider which appear to be relatively conservative at the longer elimination periods; hence the 30 or 40 per cent of premium when added to their conservative basic rates may be an adequate charge for the total package, and after all, is this not the most important thing?

I do agree with the author's conclusions that the price for an 80 per cent refund on a ten-year rolling basis with a loss ratio less than 20 per cent is subject to a great many variables, but fear that he has, to a great degree, oversimplified the calculations required to arrive at a meaningful premium. The cost of the return of premium is sensitive to the following factors:

1. *Persistency.*—Renewal persistency has much greater effect than first-year persistency, as a large portion of the additional first-year premium is paid for commission and percentage expenses.

2. *Commission structure.*—The higher the commission payable, the less of the return of premium premium will be available for funding this benefit.

3. *Elimination period.*—This is quite adequately covered in Mr. Barnhart's paper.

4. *Benefit period.*—Obviously, the longer the benefit period, the higher the gross premium and the smaller the probability that the insured will receive benefit payments of 20 per cent of premiums or more. The cost should obviously be higher for a provision attached to a five-year or age-65 benefit period policy than with a two-year benefit period.

5. *Rate level.*—The higher the absolute rate level of the insurer, the smaller the probability of claims exceeding two years' premium and the higher the cost of the return of premium benefit.

6. *Morbidity.*—One would suspect that, after an insured has had one claim, the probability of a second claim increases, though there are few data available on this. It would be a major job to apply a theory of classes to a population of insured lives to simulate accurately what would probably happen with a large volume of exposure on return of premium policies. It seems likely, however, that if persistency is significantly improved (and I expect that it would be by the very presence of the benefit), morbidity would also improve. This assumes that insureds in better-than-average health would tend to drop their policies under a conventional pricing structure but would keep their policies with the return of premium benefit included.

Simply to have some calculated cost figures comparable to Mr. Barnhart's figures in section II of his Appendix, we have run five separate profit tests for issue age 30 on a variety of assumptions summarized below. The first profit test shows the gross premium required to produce what is considered to be a satisfactory level of profit for a twenty-four month benefit with a seven-day elimination period, assuming claim costs follow the 1964 CDT Table. The second through the fifth profit tests show the effect of adding the return of premium benefit at a 50 per cent cost with persistency improved slightly and improved drastically and with improved morbidity in the last three runs. Since it is not possible to predict accurately the number of individuals receiving the return of premium benefit on a ten-year rolling 80-20 per cent basis without a computer simulation of expected results, I have assumed that all insureds who survive until the tenth and twentieth years will receive a refund of eight years' premiums.

The cost of the full refund, without regard to prior claims level, is shown as an absolute maximum cost, and it is not suggested that this

would be a reasonable or even desirable benefit structure. The results of the five profit test runs, assuming 50 per cent additional premium for the return of premium benefit, are shown in the accompanying tabulation.

	Profit Test Run Number				
	1	2	3	4	5
Gross premium	$55.00	$ 82.50	$ 82.50	$ 82.50	$ 82.50
Refund at 10th and 20th year	None	$660.00	$660.00	$660.00	$660.00
Lapse rates:					
Year 1	40%	30%	30%	20%	12%
Year 2	20%	15%	15%	10%	8%
Year 3	15%	10%	10%	8%	6%
Year 4+	12%	10%	10%	8%	4%
Morbidity scale	1964 CDT	1964 CDT	ADJ CDT	ADJ CDT	ADJ CDT
Present value of profits/100MI:					
First 10 years	$36.53	$ 25.43	$ 27.18	$ 14.52	−$ 29.60
First 20 years	$52.95	$ 47.19	$ 50.91	$ 43.48	−$ 8.01

Note.—ADJ CDT claim costs: first year, 100 per cent CDT; second through fifteenth years (100 per cent minus 1 per cent × completed years) of CDT; sixteenth year and over, 85 per cent CDT.

As shown above, the company with a 50 per cent load for a far more expensive benefit than that priced by Mr. Barnhart in section II of his Appendix still makes a reasonable profit, except when persistency improves to a level approaching Linton A. Even at the lowest persistency rates tested, it is apparent from the trend of the profit test that the company would be in the black after thirty years. The 50 per cent load included in these profit tests is only one-third of the 150 per cent load which Mr. Barnhart indicated would be required.

The details of these profit test runs are attached as exhibits to this discussion. I submit that these calculations clearly indicate that Mr. Barnhart has been unduly conservative in his pricing of this product.

Mr. Barnhart's paper is extremely timely and, in fact, seems to be almost a "topic of current interest" in itself. Unfortunately, this paper will likely have a pronounced effect on the deliberations of the Industry Advisory Committee to the NAIC Subcommittee on Non-Forfeiture Benefits and Related Matters under Health Insurance.

A preliminary draft of the recommendations of this committee was released early last summer, and this draft would have had the effect of requiring substantial nonforfeiture values under return of premium poli-

cies with 80 per cent refund of premiums after any ten-year period where claims have been less than 20 per cent of premiums (the 80-20 rolling ten-year approach). In the opinion of a number of the companies offering this type of benefit, a requirement for these nonforfeiture values would have made it competitively impossible to offer the type of benefit which they are now offering, because of the substantial premium required to provide the withdrawal benefits.

Involved parties naturally responded both in the insurance press and on a personal basis, and the Industry Advisory Committee met late in September to consider the objections of these parties. Only a few days prior to the Industry Advisory Committee meeting, a preliminary copy of Mr. Barnhart's paper was released to members of the Industry Advisory Committee as a paper being presented at the fall meeting of the Society of Actuaries. This has had the effect of having the implied blessing of the Society, without giving adequate opportunity for the expression of contrary opinions.

Mr. Barnhart has two main objections to the return of premium benefit providing for 80 per cent return after a rolling ten-year period; first, the fact that the benefit in his opinion is inequitable and discourages small claims and, second, that the benefit is underpriced. The inequity judged to be such by Mr. Barnhart is, I submit, a judgment made in an actuarial vacuum, since in practice the equity will depend equally on the following factors:

1. The marketing and administrative practices of the company offering this type of benefit.
2. Whether the benefit is being offered on a guaranteed renewable or on a noncancellable policy.
3. The claims philosophy of the insurer.

Mr. Barnhart's "ideal" benefit could be highly inequitable in practice if an insurer who had underpriced this benefit on a guaranteed renewable policy found it necessary to increase rates substantially so that it would not lose money on the return of premium benefit. This might very well have the effect of discouraging continuance of present policies in force, resulting in substantial forfeitures on lapsation. An extremely tight claims practice could also discourage policyholders from maintaining policies in force and encourage them to lapse their policies, to the benefit of the company. Considering the many problems which occur every day in the casualty insurance field, and the general attitude of the insurance industry

to maintain the status quo rather than to help the regulatory authorities and legislators cope with these problems, Mr. Barnhart's vehement attack on the 80-20/ten-year return of premium benefit appears to be little more than a witch hunt.

As to the pricing of this benefit, while I agree that the price depends on many variables, I believe quite strongly that Mr. Barnhart has done an inadequate job of taking into account all these variables. It is difficult to see how this benefit can be priced, except as a part of a total benefit and rate structure, since it is altogether possible that a company offering the return of premium benefit at an additional loading of, say, 40 per cent on a given plan, could actually lose money on the return of premium benefit but could have increased profits on the underlying policy as a result of improved persistency and improved morbidity (with a lowering of the average commission rate, average unit expense rate, and average claim cost), with the result that the marginal effect of the return of premium benefit on company profits was to increase them, while the benefit itself might be losing money.

Another point which must be considered is that the total commission paid to an agent on a policy with the return of premium benefit, especially if persistency is substantially improved, will be much greater than the total commission paid on a policy without such a benefit. From the company's point of view, this increase in agent's commission should aid in recruiting and retaining agents and should encourage agents to enter the disability income market.

If a company with very limited capital and surplus is writing a great deal of this policy and is underpricing it, then it is indeed likely that the company will end up in some difficulty, though the same can be said of a company in the same financial position that regularly accepts Table D risks as standard or of a company which invests in questionable securities. The assurance that the benefits will finally be paid and that the company will not go into receivership is more a matter of regulation than price structure.

For a company with substantial surplus, the risk that a given benefit may be underpriced is borne entirely by the company stockholders (and perhaps in some slight degree by the actuary who sets the rate for the product), and it does not seem reasonable that a company should not be permitted to sell a product simply because in the opinion of the actuarial profession the product is underpriced. If we do believe in a free enterprise system, we must be free to make our own mistakes.

APPENDIX

SUMMARY OF ASSUMPTIONS IN EXHIBITS I–V

A. All exhibits are for issue age 30 and assume a $55.00 (per $100.00 monthly income) basic policy premium for a disability plan providing twenty-four months' benefits after a seven-day elimination period. In Exhibits II–V a 50 per cent loading ($27.50) is assumed for the return of premium benefit.

B. EXPENSES

	Per Policy	Per $100 Month Unit
Issue	$10.00	$16.50
Maintenance (all years)	2.00	8.80

An average-size policy of $400.00 is assumed, so that these dollar issue and maintenance expenses become:

$$\text{Issue} \quad 16.50 + \frac{10.00}{4} = 19.00$$

$$\text{Maintenance} \quad 8.80 + \frac{2.00}{4} = 9.30$$

	Year 1	Year 2	Year 3	4 On
Percentage of total premium	49.0	34.5	16.5	14.0

C. INTEREST, 5 per cent

D. PERSISTENCY

YEAR	EXHIBIT				
	I	II	III	IV	V
1	60%	70%	70%	80%	88%
2	80	85	85	90	92
3	85	90	90	92	94
4 on	87	90	90	92	96

E. MORBIDITY AND MORTALITY

In Exhibits I and II, 100 per cent of 1964 CDT. In Exhibits III–V, 1964 CDT adjusted as follows: first year, 100 per cent; second through fifteenth years, 100 per cent − (1 per cent × completed years*); sixteenth year on, 85 per cent.

* Duration − 1.

The assumptions in each exhibit as to deaths, active life reserves, and net annual morbidity costs are as follows:

Year	Deaths	Reserve	Net Annual Claim Cost
1.....	0.00213	0.00	11.35
2.....	.00219	0.00	11.77
3.....	.00225	11.98	12.14
4.....	.00232	24.05	12.51
5.....	.00240	35.98	12.91
6.....	.00251	47.70	13.34
7.....	.00264	59.72	13.80
8.....	.00280	71.41	14.31
9.....	.00301	83.07	14.85
10.....	.00325	94.29	15.42
11.....	.00353	105.50	16.04
12.....	.00384	116.43	16.72
13.....	.00417	127.01	17.49
14.....	.00453	136.98	18.32
15.....	.00492	146.69	19.21
16.....	.00535	155.59	20.17
17.....	.00583	163.86	21.22
18.....	.00636	171.49	22.36
19.....	.00695	178.34	23.54
20.....	.00760	184.11	24.75
21.....	.00832	189.11	26.08
22.....	.00911	192.89	27.59
23.....	.00996	195.04	29.36
24.....	.01089	195.55	31.37
25.....	0.01190	193.93	33.57

In addition, Exhibits II–V assume the return of premium "claim cost," at the end of each ten years, to be $660.00 (80 per cent of 82.50 × 10).

F. Explanation of Columns in Exhibits I–V

Column

1 = Duration (0 meaning initial).

2 = tth-year profit; i.e., profit emerging in year t, valued at the beginning of policy year t, per unit of insurance ($100 MI) in force at the beginning of year t.

3 = tth-year profit per unit of insurance issued = col. 1 × L_t.

4 = Discounted tth-year profit per unit of insurance issued = col. 2 × v^{t-1}.

5 = Sum of discounted profits through t years = Σ_0^t col. 4.

6 = Gross premium valuation; i.e., the value of future profits at the beginning of year t.

EXHIBIT I

(1)	(2)	(3)	(4)	(5)	(6)
0.....	19.00—	19.00—	19.00—	19.00—	55.26
1.....	7.68	7.68	7.68	11.32—	74.26
2.....	15.25	9.13	8.69	2.63—	116.77
3.....	15.11	7.22	6.55	3.92	133.55
4.....	17.66	7.16	6.18	10.11	146.64
5.....	19.37	6.89	5.67	15.78	154.25
6.....	21.09	6.59	5.16	20.94	161.31
7.....	22.32	6.12	4.57	25.51	167.73
8.....	24.08	5.80	4.12	29.63	173.96
9.....	25.51	5.39	3.65	33.27	179.33
10.....	27.26	5.05	3.26	36.53	184.09
11.....	28.53	4.64	2.85	39.38	187.75
12.....	29.98	4.27	2.50	41.88	190.65
13.....	31.37	3.92	2.18	44.06	192.44
14.....	32.86	3.60	1.91	45.97	193.00
15.....	33.90	3.25	1.64	47.61	191.95
16.....	35.31	2.97	1.43	49.03	189.51
17.....	36.36	2.67	1.22	50.26	184.98
18.....	37.24	2.39	1.04	51.30	178.37
19.....	38.10	2.14	0.89	52.19	169.48
20.....	39.06	1.92	0.76	52.95	157.85
21.....	39.50	1.70	0.64	53.59	142.82
22.....	40.01	1.50	0.54	54.13	124.32
23.....	40.41	1.32	0.45	54.58	101.52
24.....	40.33	1.15	0.37	54.96	73.66
25.....	40.21	1.00	0.31	55.26	40.21

EXHIBIT II

(1)	(2)	(3)	(4)	(5)	(6)
0.....	19.00—	19.00—	19.00—	19.00—	54.11
1.....	21.70	21.70	21.70	2.70	73.11
2.....	33.26	23.23	22.13	24.83	77.27
3.....	37.50	22.22	20.15	44.98	54.49
4.....	40.86	21.73	18.78	63.76	19.86
5.....	42.34	20.22	16.64	80.40	24.55—
6.....	43.84	18.80	14.73	95.13	78.23—
7.....	44.84	17.26	12.88	108.01	142.77—
8.....	46.37	16.03	11.39	119.40	219.45—
9.....	47.58	14.76	9.99	129.39	311.00—
10.....	579.46—	161.27—	103.96—	25.43	419.61—
11.....	50.18	12.53	7.69	33.12	187.10
12.....	51.42	11.51	6.73	39.85	160.30
13.....	52.61	10.56	5.88	45.73	127.52
14.....	53.91	9.70	5.14	50.88	87.76
15.....	54.77	8.83	4.46	55.34	39.67
16.....	56.01	8.09	3.89	59.23	17.70—
17.....	56.90	7.35	3.37	62.60	86.46—
18.....	57.64	6.66	2.91	65.50	168.24—
19.....	58.38	6.04	2.51	68.01	265.22—
20.....	569.34—	52.62—	20.82—	47.19	380.17—
21.....	59.57	4.92	1.85	49.04	222.39
22.....	60.02	4.42	1.59	50.63	191.55
23.....	60.38	3.97	1.36	51.99	154.86
24.....	60.29	3.53	1.15	53.13	111.34
25.....	60.21	3.14	0.97	54.11	60.21

EXHIBIT III

(1)	(2)	(3)	(4)	(5)	(6)
0	19.00—	19.00—	19.00—	19.00—	58.32
1	21.70	21.70	21.70	2.70	77.32
2	33.37	23.31	22.20	24.91	83.60
3	37.74	22.36	20.28	45.18	62.18
4	41.22	21.93	18.94	64.13	28.58
5	42.84	20.47	16.84	80.97	14.79—
6	44.49	19.08	14.95	95.92	67.40—
7	45.64	17.57	13.11	109.03	130.86—
8	47.35	16.37	11.63	120.66	206.47—
9	48.74	15.12	10.23	130.89	296.96—
10	578.10—	160.90—	103.71—	27.18	404.53—
11	51.74	12.92	7.93	35.11	203.16
12	53.21	11.92	6.97	42.07	177.28
13	54.66	10.97	6.11	48.18	145.30
14	56.23	10.12	5.37	53.55	106.19
15	57.40	9.25	4.67	58.22	58.55
16	58.96	8.51	4.09	62.32	1.35
17	60.01	7.76	3.55	65.87	67.57—
18	60.91	7.04	3.07	68.94	149.72—
19	61.82	6.39	2.66	71.60	247.31—
20	565.72—	52.28—	20.69—	50.91	363.18—
21	63.39	5.23	1.97	52.88	238.10
22	64.05	4.72	1.69	54.58	205.54
23	64.68	4.25	1.45	56.03	166.59
24	64.88	3.80	1.24	57.26	120.09
25	65.12	3.39	1.05	58.32	65.12

EXHIBIT IV

(1)	(2)	(3)	(4)	(5)	(6)
0	19.00—	19.00—	19.00—	19.00—	56.52
1	21.70	21.70	21.70	2.70	75.52
2	33.37	26.64	25.37	28.08	70.79
3	37.51	26.89	24.39	52.47	43.74
4	40.76	26.83	23.17	75.64	7.13
5	42.16	25.46	20.95	96.59	38.47—
6	43.58	24.16	18.93	115.52	92.25—
7	44.51	22.64	16.90	132.42	155.42—
8	46.00	21.47	15.26	147.68	228.78—
9	47.16	20.20	13.67	161.35	314.48—
10	579.89—	227.78—	146.83—	14.52	413.99—
11	49.74	17.92	11.00	25.52	189.96
12	51.01	16.84	9.85	35.36	160.60
13	52.25	15.81	8.80	44.17	125.56
14	53.64	14.87	7.89	52.05	84.02
15	54.62	13.87	7.00	59.06	34.84
16	56.01	13.02	6.26	65.32	22.68—
17	56.91	12.11	5.55	70.87	90.30—
18	57.67	11.22	4.90	75.76	168.99—
19	58.45	10.40	4.32	80.08	260.35—
20	569.20—	92.49—	36.60—	43.48	366.39—
21	59.82	8.87	3.34	46.83	233.24
22	60.41	8.18	2.94	49.76	199.59
23	61.00	7.53	2.57	52.33	160.30
24	61.20	6.88	2.24	54.57	114.47
25	61.47	6.29	1.95	56.52	61.47

EXHIBIT V

(1)	(2)	(3)	(4)	(5)	(6)
0	19.00—	19.00—	19.00—	19.00—	21.31
1	21.70	21.70	21.70	2.70	40.31
2	33.37	29.31	27.91	30.62	22.24
3	37.28	30.05	27.26	57.87	12.73—
4	39.85	30.13	26.03	83.90	55.99—
5	40.79	29.54	24.30	108.20	105.07—
6	41.77	28.97	22.70	130.90	159.93—
7	42.24	28.05	20.93	151.83	221.16—
8	43.28	27.52	19.56	171.39	288.85—
9	44.01	26.79	18.13	189.52	364.29—
10	583.47—	339.92—	219.11—	29.60—	447.93—
11	45.74	25.50	15.65	13.94—	148.73
12	46.59	24.84	14.53	0.58	113.05
13	47.43	24.19	13.47	14.05	72.98
14	48.44	23.62	12.52	26.58	28.06
15	49.06	22.86	11.54	38.12	22.39—
16	50.12	22.31	10.73	48.85	78.54—
17	50.70	21.55	9.87	58.72	141.47—
18	51.18	20.76	9.06	67.78	211.42—
19	51.70	20.00	8.31	76.09	289.05—
20	576.16—	212.51—	84.10—	8.01—	375.31—
21	52.67	18.51	6.98	1.03—	221.36
22	53.13	17.77	6.38	5.35	186.05
23	53.64	17.07	5.84	11.18	146.71
24	53.83	16.28	5.30	16.48	102.82
25	54.17	15.56	4.82	21.31	54.17

(AUTHOR'S REVIEW OF DISCUSSION)

E. PAUL BARNHART:

I greatly appreciate the valuable additional contributions to this subject which are contained in the several discussions. The number of discussions presented not only testify to the considerable current interest in this topic but reveal dramatically the wide divergence of opinion which surrounds it. Several discussants clearly feel that the whole concept of "return of premium" has no justifiable or legitimate place whatever in health insurance. Others take me sharply to task for finding any fault at all with certain of the current provisions being marketed. I continue to be of the opinion that there is an acceptable middle ground to be found. There is a great deal wrong with some of what is on the market. On the other hand, the concept of return of premium does have some positive

and justifiable aspects, and I think a serious, honest, and open-minded effort should be made by actuaries, by the industry, and by state regulatory authorities to come up with acceptable versions of the benefit and reasonable and practical regulatory standards to apply to it.

I have the following comments on specific points brought out in the discussions.

Mr. Bartleson makes several very pertinent observations on adequate regulation. Where the insurer has a right of rate revision, it would not seem unreasonable to require, as he suggests, payment of the return benefit to policyholders not choosing to accept a rate increase. This objective would also be met if it were required, as suggested further by Mr. Bartleson and one or two others, that the return of premium benefit be in the form of a rider that can be voluntarily terminated separately from the policy, provided, of course, such a rider carries a suitable withdrawal benefit guarantee. I would prefer the latter approach, because a requirement only to the effect that a benefit must be paid to a policyholder rejecting a rate increase would seem to me to encourage further the problem of lapsation which sometimes already accompanies a rate increase. If the return of premium rider is separately terminable in any event, with withdrawal value, then no excessive encouragement to lapse the entire policy should result. In fact, the opposite might well occur, since some policyholders might elect to compensate for such a rate increase by surrendering the rider only.

Mr. Bartleson lends further emphasis to the extremely important matter of maintenance of adequate reserves on return of premium benefits. The question of reserves becomes more acute in view of the fact that no specific regulatory standards exist, and companies are largely free to follow whatever course they like in this area. Minimum regulatory standards for reserves on the benefit are acutely needed, because of the manner in which the considerable deferred liability builds up and becomes suddenly payable as a lump sum, comparable to a matured endowment but unlike any other health benefit.

Mr. Bittel's discussion I found to be particularly valuable, because it gives us a view of the subject from the regulatory side. (I should correct one minor misimpression: advance copies of the paper were not sent to all commissioners, but only to those involved with the two NAIC subcommittees directly concerned with the subject.)

Mr. Bittel comments, as did Mr. Bartleson, on the need for having the return of premium benefit available on an optional basis and separately terminable. As already mentioned, I agree with this, and I believe it to be an important safeguard either in the event of rate increases under guar-

anteed renewable contracts or in the case of policyholders whose claims have extinguished any possible future recovery under the benefit.

As to nonforfeiture requirements, Mr. Bittel mentions the requirement of extended term as well as cash surrender values, whenever this is compatible and feasible. I question the advisability of such a requirement, because I think that too frequently situations of duplicate or over insurance would result. Quite often, the reason behind a lapse is that the person has become covered under a duplicating group plan or in any case has other equivalent coverage. While he, of course, could elect the cash surrender option, and this could presumably be made the automatic option, it does not seem advisable to me to require that the carrier make an extended term option available. In those instances where the lapse is not actually voluntary (or even intentional), perhaps the alternative of an automatic policy loan could be considered, which would create a more temporary extension of coverage than extended term and therefore less potential duplication (and less antiselection). Beyond the possible value of an automatic policy loan provision, I do not see why the interests of the insured are not sufficiently protected by means of a cash surrender value. A further objection that I would have to an extended term option would be the very considerable amount of additional actuarial computation required, as well as the extensive problem of establishing appropriate standards for such an alternative nonforfeiture benefit.

Mr. Fischer presents some very cogent additional arguments in justification of the return of premium benefit. He directs further attention to the effects of the benefit in improving persistency, which in turn reduces the aggregate net cost of insurance to the body of policyholders, and then introduces an interesting consideration not covered in the paper—the potential investment advantages accruing to the policyholder purchasing the benefit. Mr. Fischer regards it as quite clear that investment of the money in the premium will bring a yield superior to any that can be realistically expected under a separate investment program. While he does not give us any example figures in his discussion, he tells me that some examples tested produce a yield equivalent to more than a 20 per cent return, before taxes, on a separate account. I am sure that Mr. Fischer intended these comments to apply to the policyholder who incurs no claims, since obviously a relative investment "loss" accrues to the policyholder who has sufficient claims to extinguish the benefit, just as occurs under a life endowment policy that ends in a death claim before maturity.

Mr. Fischer makes the comment that death terminations "automatically improve the claim histories of persisting policyholders, and radically

change the theoretical claim offsets in Table 4" (of the paper). It would have been helpful if he could have given us some quantitative results of his testing of this effect. It seems evident enough that some shift will occur as a result of the death terminations, but I feel less than convinced that the shift will be "radical." If this be so, then the cost of the return of premium benefit will prove out even higher. His comments on the effects of small variations in investment income and on repeat claim probabilities would also be more informative with some quantitative illustrations. I would invite Mr. Fischer to consider elaborating on these interesting observations at some forthcoming Society session, through either a paper or a prepared discussion.

In commenting on the formulas used in the paper to develop relative illustrations of the cost of the return of premium benefit, Mr. Fischer takes the fact that the calculations are carried out independently of the premium formula for the basic policy to imply that "policy persistency and percentage expense assumptions will not be affected by the addition of the return of premium benefit." I do not believe this to be the case. In fact, comment is made in the paper on the probable effects of the benefit on persistency and on selective persistency among claimants and non-claimants. The primary purpose of the calculations in the paper is to give a measure of the relative cost and an indication of the general level of cost of the benefit itself. I completely agree, however, with Mr. Fischer's very pertinent observation that in actual rate-making the cost of the entire policy including the return of premium benefit must be considered, because of the interaction between the two. The paper might well have given more attention to this very valid and important principle, and I am indebted to Mr. Fischer (as well as to Mr. Knowlton) for adding needed emphasis on this score.

I feel obliged, however, to disagree with Mr. Fischer's comment that "it is not material to the calculation whether the return of premium benefit is a part of the policy itself or is a rider to the basic policy." What is of significance here is the question of whether or not the *rider* is separately terminable from the policy. If it is, then we must expect that a heavier rate of terminations on the rider will occur among claimants who have exhausted the future rider benefit, so that a different pattern of asset share funding must be expected than when the benefit is integral to the policy. Thus it is not the mere question of whether the benefit may be in the form of a rider that is material but rather the question of whether the benefit thereby becomes separately terminable.

Mr. Hummel directs our attention to the investment aspect of the return of premium benefit, as has Mr. Fischer, and gives us some quanti-

tative examples based on figures in the paper. His rates of investment yield are not nearly as high as those indicated by Mr. Fischer, because he is using the entire illustrative cost of the benefit, as developed in the paper, whereas Mr. Fischer is basing his investment return on the additional ratebook premium that he would show for the benefit, which he says is appreciably less than the "actual cost of the return of premium benefit itself."

Mr. Burgess has provided us with an extremely valuable discussion that summarizes the history of the deliberations of the Industry Advisory Committee, a subject of which most of us have been too little aware. As Mr. Burgess points out, consideration of this subject goes back more than three years and has not been the hasty matter considered since only June of 1970 that some recent trade journal publicity would seem to have implied.

An even more significant point brought out in Mr. Burgess' discussion is the fact that a good deal more has been involved in the total task of the Committee than merely a question of whether nonforfeiture requirements should apply to return of premium benefits. One of the basic issues has been the question of requiring nonforfeiture values in regular individual health insurance policies! This question cannot be side-stepped, as some seem to think, simply by opposing the idea of nonforfeiture requirements in relation to *any* health insurance benefit, including return of premium. Instead, what we are confronted with is the necessity of defining the point at which nonforfeiture requirements become pertinent and practical. It is my opinion that, as a practical matter, this must be done basically in a qualitative manner. I have proposed (1) that no nonforfeiture requirements should apply to benefits that provide protection that is current in relation to the premium payment period and which expire coincident with the end of the premium payment period in such a way that the additional reserve on the benefit approaches zero momentarily before expiration; and, on the other hand, (2) that nonforfeiture requirements should apply to any benefit that is wholly deferred in relation to one or more years for which premiums purchasing that benefit are payable (such as return of premium benefits) or for which the reserve does not approach zero momentarily before the time at which premiums and protection coincidentally cease (such as a terminal return of premium benefit or contingent endowment or a paid-up benefit). It seems to me that these principles provide a clear-cut and practical basis of definition and can be cleanly applied and that they could effectively provide a foundation for consensus between the industry and regulatory authorities.

In any event, Mr. Burgess' discussion brings out quite forcefully the

fact that the total implications of the guidelines being evolved by the Committee are much broader and deeper than many people seem to suppose. We are dealing here with some very important and very basic issues.

Mr. Lazerson gives us another valuable discussion written from the regulatory point of view. I feel that particular emphasis should be given to his points 2 and 3. His point 2 is particularly apropos, because it points out that it is during the *latter* portion of the return of premium cycle that discouragement of claims is most apt to occur. I doubt that the type of provision that can reduce the benefit by more than the amount of the present claim, such as the 80-20 provision, will particularly discourage claims during the first half of a ten-year cycle. I expect it to have a much greater effect in this direction during the second half, particularly during the last two years or so. I will comment further on this point in relation to the next discussion.

Mr. Beardsley's discussion is another one that I believe has particular value, because he has had considerable actuarial experience with return of premium benefits over the last several years. He expresses the belief that the "satisfactory provision" developed in the paper "lacks any particular appeal in the market place." This may well prove to be the case, but it seems to me that we will not really know until it has been given some real sales promotion and exposure in the market place by at least several companies. Mr. Fischer's company is currently marketing a policy with a benefit of essentially this type, and my information is that sales of the product are going very well. Later in his discussion, Mr. Beardsley comments that provision of withdrawal benefits on such a plan, in his "experience, would lead to no noticeable increase in policy persistency." I had not been aware that any plan of this kind had ever been on the market prior to early 1970, and it was particularly interesting to me to learn that Mr. Beardsley had in fact already developed sufficient experience on this type of plan to have been able to reach this conclusion as to its persistency performance. He goes on to say, "Can you show me such a long-range product, with or without nonforfeiture values, which has in fact really promoted a heavy increase in sales on a consistent basis and dramatically improved policy persistency? I have not seen one yet." Neither have I, but, as I have said, the reason is that I did not know of any such product's having been put on the market until very recently. It was informative (and, I must say, disappointingly so) to learn that significant marketing efforts have already been undertaken in connection with this type of plan and that Mr. Beardsley has found them to be failures, both as to sales and persistency. I was indeed disappointed to

learn that the conclusions in the paper are, consequently, a "step backward."

Mr. Beardsley disagrees with the opinion expressed in the paper that the 20 per cent claims provision will discourage the submission of small claims. He tells us that his client company's policyowners do not seem to have performed as expected in this regard. If I am correctly interpreting the information Mr. Beardsley is giving us, however, this company sold its *first* disability income policy with a return of premium benefit only four and a half years ago. The return of premium cycle is ten years. Accordingly, no policy has, as yet, even entered the second half of any ten-year cycle. As I have mentioned before, I agree with Mr. Lazerson's view that it will be this latter portion of the ten-year cycle when the pressures acting to discourage claims will become particularly keen. After all, a policyholder who has a substantial premium return at stake, accumulated over eight or nine years, will surely think a lot more about submitting a small or moderate claim that will extinguish his entire return than would be the case during the first three or four years when the accumulation is much less and, moreover, any potential premium return is still more than half a decade in the future. I simply cannot believe that Mr. Beardsley has developed enough statistical evidence as yet to reach any valid conclusions at all on this score.

Another comment is in order concerning the relative advantages of submitting or withholding claims. The most common plan of disability coverage would probably be one with a seven-day sickness elimination period, costing about $250 per year for each $500 of monthly income. With a 30 per cent return of premium charge, the premium will become about $325 per each $500 monthly, and 80 per cent of this, over ten years, equals $2,600—a bit more than five monthly payments. Once a policyholder in, say, the ninth year, has gone through the seven-day elimination period, so that he is entitled to submit a claim, what are his chances of collecting a claim of $2,600, so that he will do as well as if he were to submit no claim? At age 40, the probability of that is on the order of a mere 3 per cent. And what are the chances that his disability will continue long enough that his claim will exceed 20 per cent of the ten years' premiums, so that he will be disqualified as to return of the other 60 per cent of premiums (totaling $1,950)? This chance is on the order of 25 per cent, after having qualified the seven-day elimination period. In other words, if the policyholder submits a claim, he is about eight times as likely to disqualify himself from any balance of the return of premium benefit as he is to collect in claims an amount equal to 80 per cent of the premiums.

The matter grows even more critical if the policyholder has incurred a

claim back during those first three or four years of the decade, equal, say, to 10 or 15 per cent of ten years' premiums. In that case, submission of any claim at all is apt to disqualify him from nearly $2,000 worth of return of premium. In the typical case of a short-term disability, such as convalescence following a cholecystectomy, the patient and his doctor know approximately how long he should remain disabled. If the likelihood is that he will remain disabled about six more weeks, thus qualifying him for about $750 in claim payments—and he *knows* this—are we really to believe that this individual will dutifully claim his $750 and thereby forfeit the $2,600 return that he would otherwise receive on the next policy anniversary? No, I am afraid that I still think, as I sit here in my armchair, that the 20 per cent claims provision is going to operate to discourage claims, among all but the most simple-minded of policyholders. If such does not prove to be the case, I shall seriously consider going into business as a claims adviser to policyholders of all companies selling the 20 per cent claims provision.

Mr. Beardsley next informs us that the 20 per cent cutoff provision, along with the rolling "restart" provision, "can actually be beneficial to the insured." This is because a "fresh ten-year period would start whenever one or more claims exceeded 20 per cent of ten years' premiums." On the other hand, under, say, an 80 per cent cutoff provision (cutoff equal to the maximum 80 per cent return), the claimant who incurred a 79 per cent claim would be stuck with running out the ten-year period, only to receive a trivial 1 per cent return, and only then can he start a new ten-year cycle.

It is indeed true that, given the proper set of circumstances, the 20 per cent cutoff provision can operate to the insured's advantage in comparison with a no-penalty 80 per cent cutoff version. But what is the relative total likelihood that any random claimant will come out better off? A little analysis readily reveals that in the great majority of situations the claimant will be worse off.

If one or more claims are incurred within the first two years of a cycle only, falling between 20 and 80 per cent, and followed by claims of less than 20 per cent over the entire ten years of the subsequent restart cycle, the claimant is always better off (with respect to the eleven- or twelve-year interval) under the 20 per cent cutoff. (That is, he loses less return premium dollars.) But how likely are such situations of claims very early in a cycle, followed by minimal claims throughout the entire restarted cycle? With the selection process and with aging, surely we may confidently assume that the probability of claims steadily increases with each passing year of each passing cycle. After the second year of any cycle, the

net advantage begins shifting to the 80 per cent cutoff provision, the exact year depending on the actual amount of claims between 20 and 80 per cent—even under this limited example of one or more claims followed by a new cycle aggregating claim of less than 20 per cent. Since claims are more likely in the latter part of each cycle than during the early part, the actuarial value of the expected return benefit is obviously significantly greater under an 80 per cent cutoff provision. And consider these additional points:

1. Even though the claimant more readily gets a "new start" under the 20 per cent provision (since he more readily gets disqualified!), he is also considerably more likely to again become disqualified as to the next cycle. He may well go through the whole policy period enjoying nothing but repeated "new starts"!

2. Even though, under the narrowly limited set of circumstances described, it is indeed possible to lose more return benefit dollars under an 80 per cent cutoff than under the 20 per cent cutoff, the policyholder still receives some recovery at the tenth year. Even if he eventually gets a recovery at the end of the restarted 20 per cent cycle, it will be from one to several years deferred. Hence the value of the expected dollars must be discounted at interest (and also, probably, as to psychology).

Mr. Beardsley himself indirectly acknowledges that an 80–80 per cent provision would be of greater total value to the insured than an 80-20 per cent benefit, because he says that it "would be considerably more expensive." Of course. It is more expensive because it is more valuable—that is, in the great majority of cases, the 80 per cent cutoff will actually be more beneficial to the insured. In the long run, far fewer 80-80 per cent policyholders are likely to be "subject to termination or twisting" than they would be under an 80-20 per cent provision.

There is still another subtle defect in the use of a 20 per cent cutoff. The fact that it can operate to reduce the return benefit by an amount much greater than the claim benefit that triggers the disqualification opens up the significant possibility of manipulation of the benefit to the advantage of the company. Thus, suppose at the termination of a bona fide total disability the claim has run up to 15 to 19 per cent of ten years' premiums. By "generously" offering a couple of extra weeks of payments, or another month or two of partial disability benefits, the company saves itself a lot of money; paying a few more dollars now may relieve the company of twenty or thirty times as much liability under the later return benefit. I am sure that only a very unscrupulous insurer would deliberately indulge in such shenanigans, but obviously a 20 per cent cutoff provision is highly

susceptible to such manipulation and abuse! Regulatory authorities should remove the temptation.

Mr. Beardsley contends that "for many insureds there would be very little more forfeiture involved than if they should purchase participating, rather than nonparticipating, health insurance policies." This statement would appear to be implying that there will be relatively more forfeiture under the usual participating contract than under a nonparticipating. I think that any such implied contention is highly open to challenge. Many mutual carriers have a very favorable record of dividend payments on hospital and disability policies, and any contention that the average participating insured will experience a less favorable net cost than the average nonparticipating insured would, in my opinion, be very difficult to sustain on the basis of actual historical statistics.

I agree completely with Mr. Beardsley that a 40 per cent premium loading is too high. My use of it was not intended to suggest that this is a "reasonable" or practical amount of gross premium loading. I used 40 per cent because, in most of the return of premium benefit projects in which I have been involved, the client has been extremely reluctant to accept the idea of any reduced commission on the return of premium rider. Regular commission rates usually mean gross loadings of 30–40 per cent. I also provided some illustration of the sharp reduction in premium that can result when the loading percentage is moderately reduced. I had an ulterior motive—to convey the fact that costs can be reduced so materially by moderate savings in expenses and commissions that from a competitive and marketing standpoint it is very desirable to consider such savings as reduced commissions on the rider. Just as commission rates are typically lower on endowment life policies than those on term life policies, I think that, inevitably, marketing and competitive pressures will bring about a pattern of lower commissions on return of premium or termination benefit riders.

In enumerating the list of factors that he believes a company should consider, Mr. Beardsley includes one that would be completely unacceptable in many states. This is the idea that a death benefit should be incorporated in the return of premium benefit. This, quite obviously, would be life insurance, and in many states life insurance may not be incorporated into a health insurance policy. Even in some states that would allow it, it would still be regarded as life insurance, and hence subject to the nonforfeiture laws, a requirement that Mr. Beardsley would expressly like to avoid.

The fact that a withdrawal benefit, as such, should be payable also in the event of death does not incorporate life insurance into such a benefit.

Death itself is not a contingency being covered; the withdrawal benefit is neutral as to the mode of termination. It is a nonforfeiture provision and hence must be payable upon withdrawal for any cause—death, voluntary lapse, or whatever. If the withdrawal benefit were not also payable upon death, this would constitute a negative death benefit and would contradict the basic nonforfeiture purpose of the benefit—surely a preposterous idea! Preposterous as it is, I mention this because on more than one occasion I have encountered the opinion that a health contract withdrawal benefit payable also in the event of termination by death involves life insurance. Such a contention is absurd. Life insurance comes into existence only when a termination benefit is payable specifically in the event of death, as here proposed by Mr. Beardsley, but not as a result of any mode of termination.

As a final comment, Mr. Beardsley has suggested that I am seeking to dictate "what insurance policies are best for the public" and would seem to be inferring that the provision developed in the paper as "satisfactory" is my concept of an ideal benefit. Such is hardly the case. In my judgment, the usual forms of the return of premium benefit now on the market involve defects so overwhelmingly objectionable that they should not be tolerated by regulatory authorities. On the other hand, the evidence seems to be that the basic concept helps sales and helps persistency. Accordingly, it seems desirable to consider what changes may be incorporated to minimize or eliminate the objections, thereby creating a "tolerable" or "satisfactory" benefit that can, hopefully, still reap some of the sales and persistency advantages. That is the potential merit that I find in the "satisfactory" benefit developed in the paper—nothing more.

Mr. Halvorson draws a parallel with retiree group life experience, concerning the question of discouragement of claims, and expresses the opinion that reduction of the return benefit by even an amount equal to the present claim will discourage claims. I do not believe that the parallel is a very valid one. The death benefit in a retiree group life program is regarded by the insured as something belonging to his beneficiary or else as a fund to pay his final expenses so that he leaves behind no terminal debt for others to pay off. I can well understand why few people used the medical expense option.

The health insurance return premium benefit is a radically different animal in that it is a return to the insured himself. Thus it is a question of $1.00 received now as a claim benefit vs. $1.00 received later as a return benefit, in either case by the insured. Moreover, the present claim may exceed the later maximum return benefit, whereas under the group life

option the death benefit is still the maximum that would be payable for medical expenses.

Even if it should happen that some insureds did not submit claims, preferring to keep the later return of premium benefit intact, I am not sure that this is anything to get extremely concerned about. Obviously, there is an interest loss on $1.00 received later rather than now, especially if "later" is several years off. But if an insured willingly elects to do this, how hard must we try to encourage him to do otherwise? But, under a return of premium 20 per cent cutoff provision, receiving $1.00 today may mean the loss of $20.00 or $30.00 of later return. If an insured does not have enough sense to measure the possible penalty for submitting a claim, then I think public regulation should act to preclude the consequences of such foolishness, by outlawing penalty cutoff provisions in the first place. Mr. Halvorson regards even the dollar-for-dollar claim offset provision, considered quite acceptable in the guideline drafts so far prepared by the Industry Advisory Committee, to be an unjustifiable example of "individual experience rating" and says that "it would no longer be insurance." This, however, is merely another version of the "discrimination" argument cited and answered in the paper. Certainly the return of premium benefit in and of itself is not "insurance"—any more than a maturing endowment, in and of itself, is "insurance." However, endowment provisions in life insurance contracts have long been established as acceptable, and such contracts very definitely involve a "claim offset"; if the insured dies, the death claim is paid and the return of premium represented by the matured endowment is not paid. The health insurance return of premium benefit, provided it employs a no-penalty claim offset, is an exactly parallel concept in health insurance. I have yet to hear any really sound argument as to why such a benefit within the framework of health insurance is not every bit as legitimate and justifiable as is the endowment benefit in life insurance. I do think it advisable that the return of premium be a separable, optional rider, with separately identified premium, so that the policyholder whose return benefit is extinguished by claims may discontinue it. Under a life endowment, the contract itself is terminated automatically by a claim, so that no further premium is payable anyway. But in health the contract can continue, and provision should be made to discontinue the rider premium once the rider ceases to have any possible value. In brief, I do not think it is constructive to compare the claim offset feature of a return of premium benefit to the experience rating of group policies. The really equivalent precedent that exists is the endowment benefit in an individual life policy.

Mr. White provides us with some further valuable insights from the regulatory point of view, and he sees little to commend the return of premium concept. Mr. White raises the interesting point of whether I view the reserves on the return of premium benefit as "life insurance reserves" for federal tax purposes. I most certainly do; such reserves involve definite morbidity contingencies and can be very specifically based on "recognized morbidity tables," such as 1964 CDT and a specified rate of interest. I see no reason at all why they would not qualify. I do not see, however, how the premium would be deductible on an individual income tax return. Only medical insurance premiums are so deductible now. Disability premiums are not, and I would surely think the IRS would disallow return of premium premiums. But I will leave the deductibility question to the IRS—if it has not already issued a ruling on the subject.

As to what is a "reasonable nonforfeiture benefit," I basically agree with Mr. White's preference for the classical actuarial definition of equitable nonforfeiture values. I do hope that whatever regulatory standards emerge will permit a degree of practical simplicity in approximating the definition. I do not think it would really serve the public interest if, in an effort to achieve refined equity, future regulatory standards became actuarially complicated (even if such standards were to create lots of work for consulting actuaries!).

I believe that Mr. White's indictment of the return of premium health policy as one "deliberately designed to deceive the buyer" is unduly harsh. I do think that the inequitable and conflicting features of the 80-20 type of provision, with no nonforfeiture values, will actually have the effect of deceiving many buyers, but I would not go so far as to suggest that the deception is deliberate on the part of its designers. It may also be true that the popularity of the benefit is based on the myth that there is no value received if no claims are incurred. Mr. White indicated that "the design of the products and the methods by which they are sold take advantage of the no-value myth and encourage the insured to believe that he is, in fact, getting 'something for nothing.' " I cannot agree. If the popularity of the return of premium concept rides on the no-value myth, then what it is doing is persuading the buyer that he is getting "something for something" rather than "nothing for something." I really see nothing particularly wrong with this if the benefit is fairly priced in relation to the very tangible expected value that it really does have and if the benefit is not inherently inequitable or deceptive in its operation. I do not believe that the version of the benefit developed in the paper as a "satisfactory" version can be fairly charged with any inherent inequity or

deception, and, consequently, if it is fairly priced in relation to its true value, I do not think regulatory authorities have any sound grounds for rejecting it.

But let me come to what I think is Mr. White's most important indictment, namely, that the benefit is "without redeeming social importance." This is a significant criticism, because it is a view widely held among knowledgeable people in the insurance industry and the insurance departments. I also think it is an unjustified criticism. The social importance of the benefit is an indirect one, but one that has been emphatically pointed out in the discussions by Messrs. Fischer and Beardsley. The benefit apparently is popular, and, accordingly, seems to help significantly in the sale and in the persistency of health insurance. As both these men have aptly pointed out, this helps to reduce the net cost of health insurance to all such policyholders and to extend actual health insurance protection to people who, apparently, will not otherwise buy—presumably precisely because of the no-value myth. Myth though it may be, they *still* won't buy. If return of premium will persuade them to buy, and to persist, without actually cheating them on price or deceiving them in its operation, and without leading to undervaluation of costs and liabilities on the part of the insurer, then I am for it.

Another, and significant, criticism often leveled at the benefit is that it soaks up money that might well be spent for more adequate actual insurance protection. But, again, would the money be so spent, in any case? Is it being so spent by most buyers who are not purchasing return of premium benefits? A rather similar popular goal of getting a "sure return" is revealed in the relative popularity of different types of death claim settlement options. How many people elect straight life annuities, even though they need all the monthly income they can get for their own maintenance through their retirement years? No, they fear the possibility that an early death will forfeit the bulk of the annuity purchase price, so they elect the reduced income provided under "ten years certain and life" or under instalment refund annuity options. It is the same thing, is it not? They want to be *sure* of "something for something."

Another complaint about the return of premium benefit is that it gives renewed emphasis to the savings element or the endowment element just at a time when interest is waning in endowment life insurance. Such interest is waning because the savings element has not been a very good investment during these recent inflationary years—and one reason for that has been the resistance of regulatory authorities to realistic valuation interest rates. There are too many other places where one can get better

than 3½ per cent! The problem, then, is not that there is anything inherently wrong with endowment insurance; it simply has not been all that great a medium of investment. If the return of premium benefit likewise performs poorly as an investment, interest in it will also wane. Let us not prejudge this; let the market place pass judgment—on equitable and properly priced versions of the benefit.

Mr. Sanders has contributed some interesting additional actuarial observations. In particular, I am indebted to him for his comments on the absolute rate of disablement, r'_x. He is entirely correct, and the notation in the paper is careless on this score. r'_x is the correct notation for the rate.

Mr. Knowlton charged that the conclusions reached in the paper are largely "arbitrary opinion." One of the conclusions which he deems to fall under this category is my statement that "clear and unequivocal objections" to the 80-20 provision are that it is "extremely inequitable" and that it operates "in conflict" with the basic purpose of the health insurance contract.

Apparently Mr. Knowlton and I are having something of a semantic problem here. He appears to be using the term "equity" in its most narrow actuarial sense of equity in the premium structure. I quite agree with him that it is possible to charge an equitable premium for the 80-20 provision, in terms of the expected probabilities confronting all policyholders at time of issue. But I choose to use the term here in a broader context. I speak of "equity" as the term relates to forfeiture and of "equity" as the term relates to fairness and consistency in the treatment of various policyholder circumstances. Merriam-Webster gives the word "fair" as a synonym for equitable, so I judge a provision that treats different policyholders in an unfair and inconsistent manner to be inequitable. I refer here to the 20 per cent cutoff provision.

Let me present one final example that may illustrate, in an even more crystal-clear fashion, why I think the 20 per cent cutoff provision is "clearly and unequivocally inequitable." Suppose that one claimant has a disability that proves to be worth 10 per cent of ten years' premiums. Another experiences a disability that is worth 40 per cent of ten years' premiums. The second person thus has an actual insured loss under the policy that is four times as great as that of the first claimant. Yet his recovery is 40 per cent of ten years' premiums, only half as much as the total 80 per cent recovery obtained by the other claimant: four times as much loss, half as much recovery under the policy. I judge that to be unfair, inconsistent—yea, verily, inequitable, whether after the fact or before the fact. And surely it is "in conflict" with the purpose of the basic coverage.

As to my use of the term "equity" in referring to the forfeiture problem, there is certainly ample precedent in technical insurance and actuarial literature. In McGill's *Life Insurance* (chap. XIV, "Surrender Values," under the section "Guiding Principles") the author speaks of "Three Concepts of Equity." One is that a withdrawing policyholder

has no claim against the company and is entitled to no refund of any amount. This view would be predicated on the assumption that the sole function of a life insurance contract is to provide certain designated benefits in the event of the death of the policyholder or, in the case of an endowment, his survival to the end of the endowment period. Failure of the policyholder to continue his participation in the venture until the happening of the designated contingency or contingencies would cause him to forfeit all his payments and all interest in the contract. The principle would be the same as that underlying the pure endowment.

This, apparently, is Mr. Knowlton's view. McGill goes on to say:

This is an admittedly extreme view but one which was generally accepted—and applied—in the early days of life insurance. . . . Such a view would not be seriously entertained today because of the generally adverse reaction to forfeitures of any kind.

As to the second concept, McGill says:

At the other extreme is the view that the terminating policyholder should be entitled to the return of all premiums paid, plus interest at the contractual rate, less his pro rata share of death claims and over-all operating expenses of the company.

This is essentially the position that Mr. Knowlton seems to be attempting to ascribe to me, but I refuse to accept any such interpretation of my position.

Let me continue to quote from McGill's *Life Insurance:*

The third and prevailing view is that the withdrawing policyholder should receive a benefit . . . as nearly as possible equivalent to his contribution to the funds of the company, less the cost of the protection which he received, and less any expenses incurred by the company in establishing and maintaining his policyholder status.

By footnote McGill adds the following:

Some persons would argue that the amount which a withdrawing policyholder receives should also reflect deductions for the expense of the surrender transaction and a contribution to the permanent surplus of the company. . . . This view holds that, ideally, the withdrawal of a policyholder should neither

benefit nor harm the continuing policyholders; but if any conflicts of interest should develop in the process of balancing the two sets of equities involved, they should be resolved in favor of the persisting policyholders.

I would say that my position is essentially this "third and prevailing view," including the footnote, applied in as practical and simple a manner as possible which still reasonably well preserves equity.

To quote from one more authority, since I am being charged with an illogical and "arbitrary" view of the concept of equity, Jordan says the following in *Life Contingencies* (p. 139):

> The determination of the *equitable* [my italics] amount of cash value to be paid to a discontinuing policyholder is a problem requiring careful analysis. The surrendering policyholder is entitled to a value based on the amount which he has contributed to the insurer's funds, after deductions have been made for the cost of insurance and expenses. In policies of term insurance, the resulting value is often so small that no non-forfeiture clause is required. With life and endowment plans, however, the non-forfeiture clause is a standard provision.

Mr. Knowlton concedes that the return of premium benefit is "somewhat tontine in nature." I would suggest that it is wholly tontine in nature, when lacking nonforfeiture provisions, because no benefit whatever is payable until the completion of the period, and then only to the surviving and persisting policyholders. As stated in the paper, "it is a modified sort of tontine pure endowment." In life insurance, tontine pure endowments are illegal—yet Mr. Knowlton accuses me of lack of consistency with industry practice.

I will comment specifically on only the third of Mr. Knowlton's examples, which he alleges show this "lack of consistency." In speaking of the idea of paying the cash value in addition to the death benefit, he says "otherwise the insured who dies forfeits his entire cash value." If this astonishing assertion be true, then such vitriolic critics of the whole fabric of life insurance as Norman Dacey, Scott Reynolds, and Robert Kahrhoff must have a point after all. I am confident, however, that at least 99 per cent of all actuaries will agree with me that they are completely wrong. The cash value is not forfeited on death—the death benefit actually consists of the cash value plus the net amount at risk.

Mr. Knowlton refers to other situations that "discourage small claims" and seems to be saying that no one has a right to criticize any one such type of provision, such as the 20 per cent cutoff in return of premium, unless he simultaneously attacks all other conceivable instances of such an evil. This seems somewhat impractical. I think real evils have to be

addressed specifically and one by one. I do agree with Mr. Knowlton's observation that the cancellability of contracts has the effect of discouraging claims. Perhaps he would wish to contribute an actuarial paper dealing with that evil. I have chosen to address my attention to what I believe are the evils of the common sort of return of premium benefit.

I agree with Mr. Knowlton that in actual rate making one must consider the total rate structure of both basic policy and rider, and in this he makes a very pertinent point, along with Mr. Fischer. But the idea that Mr. Knowlton introduces here, that the basic policy rates may happen to contain excess conservatism, capable of subsidizing the return of premium rider costs, is to me an outside consideration rather extraneous to our investigation. It also raises the question of whether such rates are then equitable, with respect to those buyers who elect not to purchase the return of premium rider. Presumably they still pay this "conservative" premium.

Mr. Knowlton lists for us several factors to which the cost of the return of premium benefit is sensitive and seems to be suggesting that only the factor of the elimination period is "adequately covered" in the paper. Perhaps so, but all his remaining items are dealt with in the paper, directly or indirectly, some of them quite specifically. He then provides us with most interesting figures, in the form of five separate profit tests on a variety of assumptions, and concludes with the following: "I submit that these calculations clearly indicate that Mr. Barnhart has been unduly conservative in his pricing of this product."

First of all, section IV of the paper is not an outright attempt to "price the product" at all but is rather an investigation into relative costs and the sensitivity of the variables. To quote from section IV of the paper, "The cost of the return of premium benefit is amazingly sensitive to the variables" and "The illustrative results, however, give a general idea of possible cost levels and a good relative indication of the effect on costs of variation in certain parameters."

Second, I submit that his figures do not "indicate" that I have been unduly conservative in pricing this product. All that they "indicate" is that the 50 per cent loading assumed by Mr. Knowlton is a grossly insufficient premium, even on the basis of his own assumptions. In support of this contention I submit the following five points.

1. In his first profit test Mr. Knowlton assumes a $55.00 premium and says that a present value cumulative margin, per unit issued and over the first twenty years, of $52.95 is deemed to be a "satisfactory level of profit." Indeed it should be. When I carry Mr. Knowlton's $55.00 premium and his test 1 assumptions over the full thirty-five years, to age 65 termination

(as should be done in any really adequate "profit test"), I find that his $55.00 gross premium breaks down approximately this way: expected claims, 24.2 per cent (less than half of the 50 per cent loss ratio bench mark followed by many states); expenses, 51.0 per cent; margin, 24.8 per cent, or about $56.00 per each $55.00 unit of premium issued.

2. In spite of the lucrative profit margin deemed "satisfactory" on the basic policy alone, Mr. Knowlton seems curiously satisfied, when it comes to all the profit tests involving the rider, to see only that the total projection ends up "in the black"—by however thin a margin. Under the assumptions of his test 5 (the only one in which his persistency assumptions even approach the illustrative assumptions used in the paper), the thirty-five-year cumulative total profit margin is a whisker-thin amount of 0.8 per cent, approximately, or about $6.20 per each $82.50 unit of premium issued. At the very least, if Mr. Knowlton's purpose is to test the validity of the illustrative calculation in the paper, one might reasonably set as the criterion that the dollar margin, per unit issued, should be the same when the rider is included as when it is not. In such case the rider itself would be a break-even addition to the total package.

What results do we obtain if we are to fulfil this criterion? Under Mr. Knowlton's test 5 assumptions, the gross premium required on the basic policy alone, to produce the same $56.00 projected thirty-five-year dollar margin as in test 1, will be approximately $45.70. The rider loading required to leave the projected $56.00 margin unchanged turns out to be approximately $65.30. As a ratebook addition to the $55.00 basic premium, this can then be reduced by $9.30, the excess margin in the basic premium under the test 5 assumptions; so we obtain $56.00 as the approximate ratebook value for the rider premium. This is 102 per cent of the $55.00 premium—more than twice Mr. Knowlton's assumed 50 per cent loading. The actual break-even cost of the rider, the figure of $65.30 above, is 119 per cent of the basic premium.

Incidentally, in test 2, where Mr. Knowlton's combined dollar margins become only slightly impaired upon inclusion of the rider, a ratebook value of about $30.00 for the rider is sufficient for break-even. Thus the ratebook rider premium required in test 5, to maintain a uniform dollar margin, is about 187 per cent of the amount required in test 2, which serves to illustrate that both the cost and the rates for a return of premium rider are "sensitive to the . . . factors."

3. Mr. Knowlton's expense assumptions are nowhere near being equivalent to the 40 per cent loading assumed in the calculations in the paper, which led up to my comment that 150 per cent might be used as a "further trial approximation." (The actual trial calculation led to a 138

per cent loading after assuming a 100 per cent loading for purposes of estimating the claim offset.) Using that portion of Mr. Knowlton's expense assumptions applicable to the rider premium (i.e., the percentage of premium expenses only), one will find that the expense loading in the gross premium is just under 20 per cent. The equivalent value of the loading factor k, then, as used in the paper, is 0.8. If the trial calculation in section II of the Appendix is redone using 0.8 for k, the calculation yields the value of only 77 per cent. This compares to the 102 per cent loading arrived at in point 2, with respect to Mr. Knowlton's test 5. Mr. Knowlton's use of expense loading assumptions which are equivalent to only half of the illustrative loading assumed in the paper is therefore grossly misleading and totally invalid, if he purports thereby to indicate that the illustrative values derived in the paper are "unduly conservative." Moreover, if he means to suggest that the 0.6 value of k used in the paper is, in itself, "unduly conservative," let me point out that the paper also gives the result when k is assumed to be 0.75, much closer to the 0.8 value equivalent to his own expense assumptions. The paper gives this result as 86.5 per cent, yet Mr. Knowlton mentions only 150 per cent in relation to his own assumed 50 per cent. Yet, he sees fit to call his figures "comparable"!

4. Mr. Knowlton incorporates reserve assumptions as to his basic policy benefits but does not bother with reserves when it comes to the rider. Aside from the regrettable implication this creates to the effect that the rider does not require reserving, this oversight also leads to a distinct overstatement of the projected profit at the twenty-five-year point where Mr. Knowlton terminates his projections. The twenty-fifth duration is exactly midway between payoff durations under the rider, and there is, accordingly, a substantial "unfunded liability" not recognized at the terminal point of his projections.

5. Mr. Knowlton's theory of an increasingly select level of morbidity, under tests 3, 4, and 5, is most intriguing. I am unable to see how this phenomenon can be expected to result from Mr. Knowlton's stated assumption under his sensitivity factor 6, "Morbidity." If the effect of the rider is only that more better-than-average-health insureds keep their policies in force, one would certainly expect a more select level of morbidity to persist, perhaps for many years, but hardly an increasingly select level. It seems to me that the only reasonable assumption underlying such an effect is that poorer-than-average-health insureds must be lapsing at a heavier rate than the better-than-average-health population. This could well be the case, so far as a rider with claim offset is concerned, because claimants who have extinguished their return benefit will

certainly tend to lapse the rider but keep the basic policy in force. I do not believe that Mr. Knowlton can really afford to ignore this group. Thus he may indeed realize increasingly select morbidity among those survivors who maintain their riders in force but must expect to see this largely offset by sharply worsening morbidity among the class of policyholders who lapse the rider. Thus margins in the premiums which apply to this class will deteriorate, and part of the presumed excess margin in the basic rates of the class maintaining the rider must be allocated to offset the worsening experience of the other group.

All the above considerations, especially points 2 and 3, reveal quite plainly that Mr. Knowlton's figures, which he claims are comparable to my figures in section II of the Appendix, are in fact misleading and a distortion. They are not even remotely comparable to mine to begin with and do not indicate even superficially what he claims they indicate. Even in terms of his own noncomparable assumptions, his results reveal nothing but the complete insufficiency of his assumed 50 per cent rider premium loading.