GENERAL

A. If a group is contemplating taking on a welfare program and has a predetermined annual premium or contribution available for benefits, what methods are available to decide the percentage of the premium that should be used for life insurance, weekly indemnity benefits, hospitalization and surgical benefits, pensions, etc.?

B. What formulas have been devised for computing contingency reserves for possible losses on mortgage loans and real estate?

C. To what extent has it been found practical to pay dividends on:
   1. Annuities in the benefit stages and/or supplementary contracts involving life contingencies after expiry of the term certain period? If such methods have been found practical, can the dividend scale be of the form that produces level or increasing dividends?
   2. Family income and other decreasing term rider benefits?
   3. Extended term insurance?

D. What practical methods have been developed for checking the adequacy of the value of annuities and settlement options derived from an annuity table without provision for mortality improvement?

MR. A. G. WEAVER, in discussing section A, said several criteria were used to determine the allocation of the welfare premium dollar. These included the pattern already established by other groups in the same industry or in the same geographical area, the indicated desires of the workers and their presumptive needs which vary by area, age and sex composition, type of industry, economic status. In addition, the objectives of the welfare program must be considered—*e.g.*, improved health of the worker and increased productivity, relief from worry regarding catastrophic illness and old age. The selection of benefits will also depend on whether the worker is expected to supplement his benefits with a personal insurance program or whether the program is a cooperative effort with substantial employee contributions to the cost.

A basic decision concerns the relative weight to be given to benefits payable immediately and in the future. While it is desirable to provide pensions for the relatively few who will still be employed at retirement age, it may be more important to protect first the many who may incur hospital or surgical expenses or even the loss of the family breadwinner at any time. The division of the premium dollar between life insurance and casualty benefits follows one of two patterns: where no union pressure is involved, employers are inclined to provide life insurance equal to a year's salary before offering other benefits; where the union is the prime mover in the welfare program, there may be more emphasis on weekly indemnity benefits and hospital and surgical plans.

Where weekly indemnity benefits are offered, the usual pattern is to provide 50% to 70% of earnings for the lower paid worker with a lower percentage for higher paid executives. Hospital, surgical, and medical expense benefits usually cover 75% or 80% of charges. Dependent benefits covering hospital, surgical and medical expenses may go beyond the accepted responsibility of the employer; however, they do have a real appeal to the family man who is usually prepared to pay a substantial part of the cost. Major medical expense insurance providing for catastrophic medical bills on a coinsurance basis up to $5,000 or even $10,000 falls in the same category.

MR. E. A. GROSSMAN, with particular reference to union welfare programs, suggested that possible guides might be the pattern set by an important or large union and the pattern which best served the purpose of bargaining, often differently interpreted by the employer and the union. Other factors included the union traditions and the trend of the times. Some union welfare plans were analyzed to show the wide variation in distribution by type of coverage.

A possible scientific approach to the problem might be based upon the techniques of Operations Research used successfully in World War II for a number of military problems. Operations Research requires certain assumptions such as the maximum amount the individual is prepared to pay for losses, retirement income desired and family responsibilities for each average salary class. Using contingency tables for mortality and morbidity and assuming distribution functions, a mathematical function would be set up which could be minimized for the optimum percentage of benefits producing a predetermined confidence of meeting the assumed requirements. These results would be modified by practical considerations, such as that the individual must not be given less than the benefit he previously had and that as little as possible should be spent on administration expenses and taxes.

DR. J. PERHAM STANLEY spoke from the viewpoint of the union. He pointed out that the employer can provide only so much for fringe benefits and must split the available money among a variety of items. Knowing that any improvement in pensions will likely be at the expense of other fringe benefits and of wages, the unions are anxious to minimize cost estimates within limits imposed by sound financing. They will think twice about financing methods which produce artificially high costs in the early years and thereby limit gains which might otherwise be made in health security and wages. He suggested that this is a basic reason for the very small fraction of insured pension plans negotiated by certain unions.

Dr. Stanley referred to one pension plan involving 150 hourly rated employees. The union knew the size of the total economic package was

limited and therefore wanted to attach to the pension element the lowest price tag consistent with safety. In the proposals submitted by insurance companies, there was a range of over two to one in the premiums suggested for exactly the same benefits. An individual policy pension trust proposal, involving funding for each individual over his remaining work lifetime, produced an excessive premium, involved relatively high commissions, and failed to reflect the higher mortality to be expected in a plan covering factory employees without a cash option at retirement. A group annuity proposal on the "unit credit" basis specified that past service liability be paid off over a ten year period, thereby resulting in an excessive premium during the early years of the plan. Another proposal followed along the same lines but failed to give the split between past service and future service which would permit adjustments for a longer amortization period. A deposit administration group annuity was also suggested, giving a choice of past service amortization periods. Costs, based on the Normal Cost Entry Age method, were high since no allowance was made for withdrawals and calculations assumed retirements would take place at age 65 although the plan provided for compulsory retirement at 68. The successful proposal incorporated a reasonable discount for withdrawals, allowed for graduated rates of retirement between age 65 and the compulsory retirement age, gave basic information allowing adjustment for a variety of amortization periods and used a level funding method over a substantial period of time.

MR. D. N. WARTERS, in discussing section B, suggested a number of possible approaches.

1. Assuming solvency will not be impaired, charge the loss against income in the year the loss occurred. No reserve is required and company earnings will be maximized in good times and minimized in bad times.
2. As quickly as funds become available, set aside a reserve sufficient to meet part or all of the possible loss. Once the reserve is established, the company earnings will be maximized in good times; during bad times, there will be a reserve to offset losses.
3. Each year set aside a portion of interest earnings. One way is to set aside enough to produce a reserve sufficient, eventually, to meet all losses incurred. Then, reported earnings would not fluctuate with principal losses. Another way would be to set aside each year enough to provide a reserve to meet losses incurred in any year in excess of interest required to maintain insurance reserves.

Certain assumptions must be made regarding possible losses on a mortgage portfolio. Studies prepared by the National Bureau of Economic Research may be of assistance. In addition, the Federal Housing Administration has been studying the question of reserves to cover future losses

on the FHA lending program but the results have not yet been made available to the public.

MR. WILLIAM CHODORCOFF referred to the Prudential's mortgage loan account, 64% by number and 50% by amount being insured and guaranteed by government agencies, with nearly all of the remainder providing for amortization on an annual basis. During the depression, the Prudential acquired 53,000 properties at a cost of approximately $472,000,000; these were disposed of at prices which, in the aggregate, enabled the company to recover the unpaid mortgage loan balances, all foreclosure costs and a substantial portion of defaulted interest. In view of the composition of its mortgage loan portfolio, the fairly wide margin of security, the type of its mortgage loan organization and its favorable past experience, the Prudential has not felt it necessary to hold mortgage loan reserves other than those required by New Jersey.

A reserve has been established with respect to investment real estate, which is deducted in aggregate from the asset value of the real estate and not carried as a reserve liability. Each property in this category is valued at cost less depreciation at rates used for Federal Income Tax purposes or at appraised value if lower. Additions to the reserve are determined by taking the excess over depreciation of the greater of (*a*) net income in excess of 3½% of cost, and (*b*) 3½% of the cost of improvements. Write-downs of specific properties to appraised values and losses on sale are deducted from this reserve, which amounted to approximately 8% of the book value of investment real estate at the end of 1953. An ultimate reserve of 25% of book value would not be unreasonable.

MR. R. M. DUNCAN stated that the formula adopted for use by a small or medium sized life insurance company should be fairly simple and empirical. In his opinion the important point is that some regular reserve building program consistent with the character and needs of the individual company should be adopted and periodically reviewed. Initially, and while an adequate reserve is being accumulated, he would transfer some current earnings to such a reserve and would supplement it with related net capital gains, if any.

The Teachers Insurance and Annuity Association established a special mortgage and real estate reserve program in 1951. At first, gain and loss fluctuations on real estate were absorbed through unassigned surplus. For government guaranteed mortgages, the reserve consisted of gains net of losses. For conventional mortgages, the reserve was based on the portion of the original book yield in excess of the sum of the current yield on long term treasury bonds plus 1½%, increased by net profit and reduced by net loss on sales and redemptions of mortgages, plus miscellaneous investment income, *e.g.*, mortgage commitment fees.

Subsequently the increments in the reserve were related to earnings in excess of the FHA small mortgage loan rates current at the initiation of the loans, plus $\frac{1}{4}\%$. In addition, the reserve for government insured or guaranteed mortgages is being accumulated by yearly increments of $\frac{1}{20}$ of 1% of asset values and has also been expanded to include capital gains and losses on real estate admitted asset values as well as for capital gains and losses on mortgages.

MR. M. R. CUETO, in his discussion of section C, referred to the New York Life practice regarding dividends for immediate life annuities. The dividend scales for such annuities have always been of the form that produces decreasing dividends by duration. No difficulty has been encountered with either the agency force or the annuitants themselves. In view of the fundamental characteristics of a single premium life annuity with decreasing reserves with advancing duration, level or increasing dividends seem to be entirely artificial.

Prior to 1954 the New York Life did not issue family income as a rider benefit but only as a basic part of certain policies. Dividends on the family income element in such policies generally increase with advancing duration. The decrease in gain from mortality has been minimized by using one average amount of insurance for the entire decreasing term period instead of amounts which decrease each month. The New York Life extended term insurance nonforfeiture benefit is nonparticipating.

MR. W. J. NOVEMBER described the methods used by the Equitable, which has been issuing immediate annuities on a participating basis for twenty years, to accomplish their objective of avoiding decreasing dividends. Their original method, described in a paper by Mr. Kingsland Camp in *TASA* XXXVI, had as a basic principle the equalization of the yearly dividends. A full account of the subject is given in a chapter on participating annuities in *Actuarial Studies No. 6*, which contains the criticism that if annual contributions to surplus tend to increase, a level dividend is nonconservative since it will be anticipating future profits. In an effort to overcome this objection, a more complicated method, as described by Mr. Camp in *TASA* XL, was used for several years but was found too cumbersome. They therefore reverted to the original idea and are using the straight equalization method with its resulting level dividend scale.

He pointed out that under the equalization process a company is not committed to continue a particular level dividend scale, but may make adjustments upward or downward as indicated by the experience. From time to time the Equitable reviews the factors entering into the dividend calculation, and recalculates the dividends if there has been a sufficient change. For example, in 1952 the mortality factor of the equalization pre-

mium was changed to one based on the *a*–1949 Table with Projection B. With the establishment this year of new rates for immediate annuities, based on a variation of the ELAS Life Income Mortality Table, the Equitable decided to use the same modernized mortality basis in the equalization premiums for the new policies. The result is an equalization with respect to the interest and loading return elements only, which is conservative in its effect since these two elements would normally produce decreasing dividends.

While one of the insurance periodicals reports participating immediate annuities issued by only 7 out of 103 companies for which it shows annuity rates, the Equitable believes the added complication to have been worth while, since the return to annuitants under contracts more recently sold has been better than if they had been issued on a nonparticipating basis, and under the older contracts a margin has been available for making adjustments by reducing or eliminating dividends when the interest and mortality assumptions proved to be too optimistic.

Mr. November found it difficult to reconcile the issue of immediate annuities on a nonparticipating basis with the practice of most companies to treat life income settlements as participating, at least to the extent of excess interest on the annuity-certain portion. With respect to the deferred annuity portion, he felt that adequacy of margins rather than practicality of method is the key consideration. In view of the rates that companies have been guaranteeing, he did not see how the idea of paying dividends after the annuity-certain period could be favorably considered. On one group of policies with an interest rate guarantee on life income settlements conservative enough to justify somewhat broader participation than is usually granted on such settlements, the Equitable has been allowing decreasing settlement dividends composed of excess interest on both the annuity-certain and the deferred annuity portion, but is awaiting further experience before bringing the mortality element into the dividend.

Their premiums for family income benefits were set at a level close to the expected costs and consequently it was not expected that the dividends on the basic policy would be increased or decreased because of the family income provision. However, the continued improvement in mortality has reduced the cost of the benefits so substantially that when they lowered their family income premiums in 1951, they felt they should give some dividend recognition to benefits issued at the old rates. For issues on the American Experience table a level scale of dividends, constant for all issue ages and family income periods, was adopted. For CSO issues prior to 1951 the dividend is the difference between the premium charged

for the benefit and the current new business premium. In their opinion this practical method does a good job of maintaining equity between old and new issues.

MR. R. F. PRESTON indicated that a brief survey of the practices of leading companies showed that only a few are paying dividends on family income riders. In the early policy years, when the mortality gain would be the largest, the reserves are either negative or a low positive amount so that excess interest earnings would be small, if any. Furthermore, since the expense of underwriting and administering the rider is assumed to be carried largely by the basic policy, loadings have been kept at a minimum and gains from this source should be negligible. Practical considerations against granting dividends include the increased administrative expense on a relatively small premium and difficulties involved where a company offers both nonparticipating and participating contracts.

Where the margins involved permit the decreasing term riders to receive some participation in surplus, a method having the merit of simplicity is to calculate an experience premium and pay a flat dividend consisting of the difference between the gross premium for the rider and the experience premium. Greater simplicity and expense saving which is consistent with the low gross rate for the rider are achieved by considering the benefit a policy adjunct which will be nonparticipating, priced accordingly.

MR. DANIEL BARRY, in discussing section D, indicated that the New York Life had recently made tests of the adequacy of the mortality basis used on existing annuities and settlement options, which makes no allowance for mortality improvement. The projecting commutation columns developed in Mr. Sternhell's paper (*TSA* II) were used with the basic values obtained from *Annuity Tables*, published by the Society of Actuaries in 1952. The IBM 607 Model 2 Electronic Calculator was used and it was found possible to value all of the single life annuity benefits by year of birth in a single run. The method consisted of punching an 80 column punch card with the year of birth, with the attained age corresponding to a particular valuation year, and with the needed standard and projecting commutation functions. Summary cards were coded with the type of benefit, sorted by year of birth regardless of benefit, collated by year of birth with the detail cards, and punched with the applicable reserves and reserve factors. Devices in the "607" termed Selectors were used to determine the type of reserve factor per unit of annual income to be punched in the summary card on the basis of the coding for the particular benefit. After the calculations were completed, the summary cards were then re-sorted as desired for printing and tabulation.