



The Actuary

The Newsletter of the Society of Actuaries

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MAY, 1975

No OASIs

Report of the Panel on Social Security Financing to the Committee on Finance U.S. Senate: Superintendent of Documents, Washington, D.C., 20402, pp. 31, 50¢.

by Robert J. Myers

Senate Resolution 350, June 26, 1974, provided for "an expert, independent analysis of the actuarial status of the social security system," to be made for the Senate Committee on Finance. A Panel was duly named to make this analysis, and it submitted its report on Jan. 31, 1975, and this is contained in a Committee Print. The Panel had as its Project Director, William C. L. Hsiao, and it included three other actuaries (Meyer Melnikoff, Ernest J. Moorhead, and Walter Shur) and two economists (Peter A. Diamond and Edmund S. Phelps). All four actuaries are Fellows of the Society of Actuaries and Members of the American Academy of Actuaries. The report, while covering only OASI, is indeed an excellent contribution to the studies being made by various interested groups of the serious long-range financing problem of the entire OASDI portion of the Social Security system.

The Panel concludes that the long-range average cost deficiency is about 6% of taxable payroll, as compared with the figure of 3% shown in the 1974 Trustees Report. The increase in the deficiency results from the Panel making different assumptions in several areas, as follows:

(1) *Economic Assumptions* — Long-range assumptions of 6% annual increases in wages and 4% in prices, instead of 5%/3%.

(2) *Fertility Assumptions*—Although assuming the fertility rate to be at the replacement level ultimately, a decline from the present level to a rate of 1.6 in 1980 (instead of a gradual increase

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CHANGES

Gary N. See has decided to seek fresh fields and pastures new and it is with regret that we witness the departure of our genial Executive Director. On behalf of the Society we tender our thanks for his counsel and help and also a special "Thank You" from the Committee Chairmen and members who had occasion to work closely with Gary. We wish him well in his new post and we expect to keep in touch with him as he attends Society meetings.

The new Executive Director, Peter W. Plumley, needs, or should need, little introduction to the members since he had been, until May 1, Chairman of the Education and Examination Committee. Many students and ex-students will be seeing him at Society meetings in the future and will probably be surprised to see that he does not have horns and a tail. His work on the Education and Examination Committee for several years deserves the grateful thanks of the Society and the Society is lucky in that the fruits of his experience on that Committee will continue to be available.

Harold G. Ingraham, the present Vice General Chairman of the Education and Examination Committee will succeed Mr. Plumley as General Chairman. □

Actuarial Meetings

- June 6, Seattle Actuarial Club
- June 12, Baltimore Actuaries Club
- June 12/13, Canadian Institute of Actuaries, Winnipeg
- June 12/13, Southeastern Actuaries Club
- June 12/13, Actuaries Club of the Southwest
- June 19/20, Middle Atlantic Actuarial Club

THE SIMPLE LIFE

The Nature of the Whole Life Contract, A Research Report by the Institute of Life Insurance.

by Arthur Pedoe

This report was prepared in response to a request by the Task Force on Life Insurance Cost Comparisons of the National Association of Insurance Commissioners. The Institute of Life Insurance was requested to deal with "The nature of the whole life contract, taking into consideration the assumption that it may be separated into protection and savings elements . . ."

The Foreword states that: "Although a reading of the whole life contract discloses no language to support divisibility, such misinterpretations have persisted. . . The state of confusion has also been a matter of continuing concern to The Institute of Life Insurance for many years." Hence the concern to readers of *The Actuary*.

The contract chosen for analysis is the simplest form of life policy where both death benefit and premium continue to the end of life however many years that may be. This policy is called "ordinary life" or "straight life" or, as in this report, "whole life."

The report first discusses the origins of the whole life contract and the development of cash values payable to the withdrawing policyholder. It then generally discusses the attempts of many critics of the life insurance industry as well as certain consumer news magazines to split the whole life contract into its insurance and investment elements.

To reinforce the concept that a whole life contract is indivisible, the report next contains six sections on "How They See the Whole Life Contract," utilizing the viewpoints of the Lawyer, Actuary, Educator, Agent, Accountant and Con-

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The Actuary

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 articles, criticisms, and discussions in this publication.

EDITORIAL

IN the last issue, Mr. Leckie extended an invitation to attend the June meeting of the Canadian Institute of Actuaries. We trust that many of our readers will accept the invitation. Remembering the maxim about the other fellow's grass, our readers may pardon us for commenting in advance upon the program. We do this for another reason. We tend to be parochial in our professional reading and thereby possibly miss opportunities of enlarging our actuarial horizons.

The program has at least two items which seem important and attractive. There is a Panel on *The Actuary as an Expert Witness* and a Workshop discussion on *Legal Liability of Actuaries*.

To start with the last-mentioned, we wonder if sufficient attention has been given to the legal liability position of the actuary. Consulting actuaries are at least conscious of some of the hazards they are exposed to and they usually carry some form of liability insurance. The question we would raise is whether it might not be desirable to acquaint all of the Society members with the more general areas of legal liability in which the actuary might find himself irrespective of his affiliation. We realize that it may not be possible to cover this subject in a reasonably brief manner because of the varying jurisdictional interpretations and court decisions. The attempts of the profession to gain recognition and to be better known suggest that we should now be better aware of possible legal liabilities.

The Panel on *The Actuary as an Expert Witness* should be revealing. The record of actuaries as expert witnesses will be mixed, some plus and some minus. Speaking from a limited knowledge we seem to find a reluctance on the part of the Court to accept actuarial testimony. Sometimes the Court has preconceived ideas of actuarial valuations and may, as a result, completely ignore the most skilled actuarial testimony in handing down a decision.

The actuaries might take some poor comfort from procedures and actions in English law. In 1971 the Law Commission published a working paper on the subject of *Personal Injury Litigation: Assessment of Damages*. The actuaries, over many years, had made some progress in being recognized by the Courts in such cases. A case in the House of Lords in 1970 however, at a minimum put a new barrier in the way of this progress. The Law Lords favored the *multiplier method* of assessing a lump sum for damages. The Court decides the multiplying factor to be applied to the annual income lost by reason of the personal injury. There is no consistency in determining this factor.

One of the Law Lords said:

"But I do not think that actuarial tables or actuarial evidence should be used as a primary basis of assessment. There are too many variables and there are too many conjectural decisions to be made before selecting the tables to be used. There would be a false appearance of accuracy and precision in a sphere where conjectural estimates have to play a large part."

We might mention a Panel on *Dilemmas of Modern Man*. One authority says "to be in a Dilemma is to be faced with two (and only two) alternative courses of action each of which is likely to have awkward results."

The report of this session should be interesting.

LETTERS

The Actuary as a Professional

Sir:

I am provoked by John Angle's article on *The Actuary as a Professional* to set down some dearly held ideas of my own on the subject. Mr. Angle, after discussing professionalism from several points of view, concludes that it is a fuzzy abstraction and that professional rules may inhibit research and regiment practice. He says: "Somehow I find the rule making of professionalism the antithesis of the scientific ethic which encourages all members to untrammelled debate over the quality and objectivity of any scientific work presented by a fellow scientist. **** "Not only are professional-vocational rules of conduct likely to stifle the iconoclastic spirit needed by a good actuary but they are apt to curtail his venturesomeness." To my mind this concept of professionalism is unconvincing and depressing.

Words mean different things to different people—particularly in these decadent days when the teaching of English is downgraded in the schools, when supposedly educated people confuse "imply" with "infer", and when "discrimination" can either mean something very good or something very bad. So it is with the word "professionalism". It seems to me that there are three distinct uses to the term, which for the sake of clarity I will give in oversimplified and exaggerated form:

(1) The professional is someone who does something for money. Thus he is directly opposed to an amateur, who will do the same thing for love. In this sense a professional does not have to be good at his job, or to belong to a professional body, or to maintain a high standard of conduct. It is even suggested sometimes that the amateur has a higher ethical standard than the professional. I am reminded of the former distinction between Gentlemen and Players in English cricketing circles.

(2) The professional is an expert, marked by the excellence of his performance. This unfortunately is the most prevalent meaning given to the term. The common view is that the professional is a skilled workman who does

A.C.W.

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an excellent job at whatever he does for a living. Excellence is indeed a characteristic of the professional—but without a further ingredient the actuarial profession will not achieve its full potential for the good of its members and its public.

(3) The professional is someone who gives priority to the interests of society, his profession, his client or employer and his own interest—in that order. He is normally earning his living by his occupation and providing an excellent service, but in addition he is bound by an ethical responsibility. Conflicts between the above mentioned interests may be rare, but if they do occur, the professional's duty is clear.

I believe that in claiming to be professionals, actuaries must subscribe to this third concept, as do those in the traditional professions of law, medicine, and the church.

Let me hasten to add that I see no reason why a professional man, in this finest sense, should not earn a high income. He may, and often does, charge at a high rate for his services. In the long run, I believe that his high principles of professionalism will result in material rewards even if he foregoes income in the short run. Nevertheless, the point is that a person who puts money first, or sells himself to the highest bidder, is not a professional, regardless of his occupation, but a tradesman and a poor one at that.

A professional must be prepared to tell his clients or employers what they do not want to hear. He must be prepared to risk losing a client or to risk having to resign his job rather than compromise his principles. I have known actuaries who have lost clients through insisting on the truth as they saw it, and who have refused to accept tainted assignments. I have known a senior actuary who resigned his employment on a matter of principle. I have known a chief actuary of a social security administration who resigned under similar circumstances. I honour these people for their integrity and the strength they have given to the actuarial profession.

Since actuaries are human, they need all the support they can get from their

fellows. It is unlikely that the individual can always stand up to pressure and that the highest standards can be achieved without the support of a central body. Lord Boyd-Carpenter, in a splendid address to the Institute of Actuaries in Great Britain in July 1973 (JIA100), stated what he meant by a professional. One condition was that members must be qualified by means of some external examination. A second was that there must be some form of control over its members by some more or less authoritative governing body. A third was that the professional man has a duty to his client or to his employer, and he has a duty to his conscience, to his professional standards and, if those fail, to the governing body of his profession. "In the ultimate crunch, the professional man puts his professional honour, his professional integrity, his duty as a member of a profession, above the interests of his client, above the interests of his employer."

Admittedly, it might be possible for a governing body to exercise so rigid a control of conduct and to make such foolish rules of practice, as to inhibit research and creativity. This danger seems rather remote in the case of the actuarial profession which in general is under-organized rather than over-organized. In fact, the central body can do much to encourage research and development through its committees, its publications, its meetings and otherwise. The idea that it is desirable to do without rules and standards in order to foster creativity and inventiveness seems to me a relic of the obsolete American frontier mentality that has no relevance to present-day conditions.

A further reason for central control is that in many situations the client or even the employer of a professional man is very much at his mercy. A client or employer may not be in a good position to judge the quality of the advice he receives. The principle of *caveat emptor* works very imperfectly in these situations, since it is difficult or impossible for a comparison to be made of the products sold by different professionals. In these circumstances the professional man's duty to act ethically and the Code of Conduct set down by the governing body become supremely important.

If the actuarial profession is to grow strong and best serve the public, it needs

a central body that is watchful of the professional conduct of its members and gives a good measure of guidance to their practice in a Code of Conduct and interpretations. All actuaries should support the Academy and its constituent organizations in their efforts to formulate appropriate rules and to raise the status of our profession—using the word in its finest sense.

Laurence E. Coward

* * * *

Guidelines

Sir:

One of the best features of current Society and Academy activities is the circulation among members of proposed guidelines on important topics. A recent example is the matter of GAAP principles with respect to dividend distribution.

What concerns me in this area is the potential for confusion between the function of the accountant and the function of the actuary. The guidelines being proposed would assign to the accountant, as a subject covered by GAAP, the definition of the amount available for distribution as dividends to participating policyholders.

The accountant is a professional whose function is to record in financial terms what other people have done. This is vital and important function, and it should not be confused with other functions, lest there be conflicts of interest. He records what premiums have been collected, what commissions and other expenses have been paid, what investment income has been received, what claims have been paid, what reserves have been established, and what dividends have been paid to policyholders and for stockholders. It is not his function to carry out any of the above business functions: for example, the accountant does not sell insurance, hire agents, draw agency contracts, underwrite new business, control expenses, determine whether a claim should be paid, set premium rates, calculate reserves, determine a dividend should be paid, or take responsibility for any other management function.

The actuary is a professional who has the responsibility for many of the above insurance functions, for example, setting premiums, determining dividend scales,

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and calculating reserves among others. These functions must be the responsibility of someone, either the accountant or the actuary; if the responsibility is shared, then in reality it belongs to neither one. If the actuarial profession accepts the right of the accounting profession to take a hand in determining how much money is available for dividend distribution, then it is possible that amounts will be distributed which are either too large or too small.

It is the function of the actuarial profession to quantify the future, and to recommend those business decisions which follow from this quantification; this function should not be handed over to any other group, no matter what their label may be. The recording function and the operating functions must be kept distinct and separate from each other.

George L. Hogeman

In Residence

There are regular reports in the press of poets in residence, musicians in residence, and corporation executives in residence, at various universities. This is building a bridge over the gap that separates the academic world from the outside world. The other day we were glad to learn that actuaries had not been overlooked in this bridge building. Our former Executive Director, Barry Watson, and our present Treasurer, Ms. Anna Maria Rappaport, have both been in residence at the University of Michigan, Barry in 1974 and Ms. Rappaport this year.

We hope that the practice established at Michigan will be followed by other colleges and universities and it might well give the Society an opportunity to spread the gospel among those schools which do not have an actuarial science course.

Death

James A. Roberts

Cost Comparisons

Sir:

The recent Report on Analysis of Cost Comparison Index Methods by a committee of the Society is the first analysis that contains sufficient factual information to point the way to a practical and reasonable solution to the comparison index problem. The Report does not attempt to draw conclusions, but to present facts. On a subject such as this no body is more competent than the Society to render an opinion and in this instance, when it is quite certain that some governmental bodies will reach (or have already reached) a conclusion, it seems appropriate that Society members do attempt to draw and present conclusions. Further, *The Actuary* is a vehicle which can serve to elicit some individual opinions. So, I present my conclusions, and the thinking which led me to them.

First, I noted the following:

1. Use of interest is essential.
2. Mortality, as such, should not be used, but possibly reflected to some extent by adjusting the interest rate.
3. Renewal lapse rates, as such, should not be used, but possibly reflected by adjusting the interest rate.

These items together suggest the use of a "high" rate of interest, at least compared with the 4% in the NAIC model regulation. Let us say 7%.

4. Cash values should be reflected in the method.

These criteria allow the elimination of the two traditional methods, the two interest adjusted with mortality methods, and the interest adjusted payment method. The Linton Yield method, with YRT premiums of zero clearly becomes equivalent for ranking purposes with the IAC method, and can be discarded.

The Standard Mortality Cost Index is defined as the IAC for the policy divided by a standard IAC. However, in the equivalent form indicated in the Report, the denominator may be viewed as an adjustment factor computed by taking all cash values (at duration n or less) into account. But with an assumption of zero renewal lapse rates, intermediate cash values between durations 1 and n are irrelevant when viewed as benefits, so that such an adjustment factor seems out of place. Without it, of course, the SMC is the same as the IAC, so I would again discard the former.

In order to analyze the remaining methods, I first expressed them in the simplified form resulting from the imposition of the criteria mentioned above: zero mortality rates, zero renewal lapse rates and a first year lapse rate of w .

The Risk Premium Index method takes the form:

$${}_n RPI = \sum_{t=1}^n t IAC \ddot{a}_{t\overline{|\eta}} / \sum_{t=1}^n \ddot{a}_{t\overline{|\eta}}$$

This expression is independent of w , the first year lapse rate. In fact, the general expression appears independent of the first year lapse rate so the index's relative stability under varying lapse assumptions is not surprising. The result is merely a composite of IAC, but one using values of IAM from 1 to n .

The Company Retention method (with a minor approximation involving terminal dividends) takes the form:

$${}_n CR = (1-w) {}_n IAC \ddot{a}_{n\overline{|\eta}} + w IAC$$

Clearly when w is small and n large, there will be close correlation between ${}_n CR$ and ${}_n IAC$. Conversely, with large w and small n , the correlation will be very poor.

Of these last two composites, the RPI involves, I think, too many components and ignores the most significant lapse rate in the first year. So using the reduction of the CR method, one could define a modified IAC:

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PHILOSOPHY?

Philosophies in the Computation and Dissemination of Dividend Illustrations. Prepared by the SOA Committee on Cost Comparison Methods and Related Issues, 1974, pp. 85.

by R. G. Boeckner

This is the second report of the Society's Committee on Cost Comparison Methods and Related Issues chaired by Bartley L. Munson. Like the first report (*The Actuary*—March 1975), this was prepared at the request of the NAIC which described the research project as follows:

"For a representative group of participating life insurance policies, each company would be asked to describe its philosophy in the computation and dissemination of dividend illustrations."

On the basis of this the Committee considered that they were being asked to study:

(1) Whether under any method of cost comparison of life insurance the ex-

isting methods of handling dividend illustrations are adequate and proper for fair and reasonable comparison, and

(2) Whether the current methods of disclosure and qualification of illustrated dividends are sufficient.

While each company was asked to describe its philosophy regarding dividends, the Committee designed a questionnaire to obtain opinions and information on company practices from individual actuaries including consultants. The areas of the report containing opinions are more interesting than the tables listing current practices, although an actuary involved with dividend determination can find from the tables if he is in the mainstream of actuarial thinking.

Responses were obtained from 111 of the 142 U.S. and Canadian life insurance companies surveyed; only 2 out of 46 consulting firms responded. The low response from the consultants is unfortunate because they may well influence

the thinking of many small insurance companies.

The first chapter of the report discusses disclosure of dividend information on new and existing business. While a significant effort is made to provide illustrations to prospective buyers, no company appears to make a full-scale effort to update illustrations held by existing policyholders when dividend scale changes are made, even if dividends are decreased. The main reason given for not doing so is the cost of preparing illustrations for all existing policies on a new scale. However, very few companies would not provide illustrations for a specific existing policy if the policyholder asks for one.

When asked if they believed that the public is sufficiently aware of the non-guaranteed nature of dividends, 71% of mutual company actuaries said "yes" but only 28% of the stock company actuaries agreed. Unfortunately, the questionnaire did not allow the stock company actuaries' responses to be divided into those whose companies write some par business and those whose companies write non-par only. If expenses continue to increase dramatically and interest rates drop from historic highs leading to dividend decreases, public response may well provide an answer.

The report's second chapter on dividend philosophies reveals general consistency among actuaries although there were a few widely divergent opinions. The report attempts to develop a broad composite dividend philosophy which should be required reading for all actuaries involved in dividend determination. The answer to specific questions will not be found but this part of the report does summarize traditional actuarial principles.

There was one rather unusual response: "Dividend scales are produced on the basis of reasonable assumptions at the time a policy is developed. This dividend scale is generally used unchanged thereafter. Little has been done to review existing dividend scales relative to original assumptions and the corresponding appropriate assumptions today."

Despite a general agreement on overall dividend philosophy, when it comes to actual assumptions for dividend scales, there appears to be less consistency. About half the companies responding use current experience, while

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$$n MAIC = n IAC + \left(\frac{w}{1-w} \cdot \frac{1}{\ddot{a}_{\overline{n}|i}} \right) IAC$$

For $i = .07$, $w = .10$, the factor in parenthesis is about 1.5% for 10 years, and 1% for 20 years. With such an adjustment term, the arguments to include interim and especially first year cash values are ameliorated, and the measure addresses itself to two of the main cost problems: short term cost on early surrender and long term cost over a stated duration. A first year lapse rate of 10% would seem adequately high for MIAC determined using an annual mode of premium payment. Loadings for other modes would adjust to some degree for the higher lapse rates of those modes.

So my conclusions are these:

- a) Displaying IAC for durations 10 and 20 as usual, augmented by IAC for duration 1 (or what may be tantamount to that, displaying the first year premium, dividend and cash value) should provide for adequate cost disclosure.
- b) If a composite is desired for industry ranking purposes or for the consumer, MIAC for duration 20 would be adequate.

One further thought arises on policies with non-level coverage: IAC could be divided by an "equivalent level amount" taking only interest into account. That is

$$n IAC = \frac{\sum_{t=1}^n t P_x (1+i)^{n-t+1} - \sum_{t=1}^n t D_x (1+i)^{n-t} - n CV_x - n TD_x}{\sum_{t=1}^n t F_{2x} (1+i)^{n-t+1}}$$

This adjustment gives heavier weight to insurance in the near future compared with insurance in the distant future.

Some additional study would be required to determine if this approach produced reasonable relationships among costs of various plans of insurance. T. C. Sutton

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Letters

Negative Interest

Sir:

I have recently derived the two compound interest identities given below and am sure that many readers of *The Actuary* can benefit from these formulas. I have found them extremely helpful when one is dealing with a Hewlett-Packard Model 80 (HP-80) electronic calculator.

The identities are as follows:

$$\begin{aligned} \ddot{S}_{\overline{n}|i} &= a_{\overline{n}|d} \\ \ddot{a}_{\overline{n}|i} &= S_{\overline{n}|d} \end{aligned} \quad \text{where } -d = \frac{-i}{1+i}$$

Mathematical derivation:

$$\ddot{S}_{\overline{n}|i} = \frac{(1+i)^n - 1}{d} = \frac{(1 - (1/i)^{-n})}{-d} = \frac{1 - (1-d)^n}{-d} = \frac{1 - v^n \cdot d}{-d} = a_{\overline{n}|d}$$

$$\ddot{a}_{\overline{n}|i} = \frac{1 - v^n}{d} = \frac{v^n - 1}{-d} = \frac{(1-d)^n - 1}{-d} = S_{\overline{n}|d}$$

My own realization of these identities was not connected with the above mathematical derivation, however. One day I was working with the pre-programmed immediate annuity and forborne annuity function keys of my HP-80 calculator in the solution of interest-adjusted net costs. I mistakenly pressed the incorrect keys while, at the same time, having entered the wrong data into the calculator.

To my surprise, I had solved for the interest rate of an immediate annuity instead of the related forborne annuity due. This "interest rate" turned out to be the negative *discount rate* corresponding to an interest rate i .

I guess not all discoveries are the result of much consideration of carefully thought out ideas!

Robert K. Clements

Philosophy?

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the remainder generally use current experience altered to reflect possible or probable future changes. A similar split was obtained when the questionnaire asked if identical assumptions were used for new and existing business.

Furthermore, 79% of the respondents indicated that they were satisfied with their companies' current practices. When asked if the actuary has the responsibility to illustrate only those dividends which he or she feels probably can be

paid, 25% of the respondents hid behind the regulatory requirement of several states that dividend illustrations must represent current experience. It is to be hoped none of these people is in the group that deviate from current experience when establishing dividend assumptions.

A more acceptable response was: "Likelihood of payment should influence the actuary to cut back illustrations if the future is bleak, but not to improve illustrations if the future is bright. An illustrative dividend scale should be based on current circumstances, adjusted for known adverse changes."

This philosophy might lead to excessive conservatism.

With only two exceptions, the respondents felt that dividends should be included in cost comparisons among participating policies. However, when asked if dividends should be included in cost comparisons between a par policy and a guaranteed cost policy (and if so, on what basis), the answers more nearly reflected the expected biases of the respondents' employers.

Almost everyone agreed that dividend illustrations *could* be manipulated to produce favorable cost comparison results and many people answered the follow-up question "how" in more detail. However, it was reassuring that in practice most actuaries, while giving serious consideration to the comparative cost position at issue, do not generally do so to the detriment of the company's general philosophy regarding equity among classes of policyholders.

A large majority said there was no need to establish a prescribed method to calculate dividends. Principles of equity should apply and regulators prevent abuses through the examination procedure. There was greater support for establishing a prescribed method for use of dividend illustrations to insure uniformity and consistency.

The paper concludes with a brief summary of the results of the questionnaire. Those who read only the summary will miss the flavor of individual responses and may not appreciate the diversity of opinion that exists within the profession on a rather fundamental subject.

While the report contains seven chapters and two appendices, it is only 85 pages and the reading time is not very lengthy. I found quite useful the 12-page appendix summarizing the existing statutes and regulations. There were a few points of which I was unaware despite a conscientious effort to keep up-to-date on the legal constraints.

This report is interesting and informative. Perhaps it is unfortunate that the Society of Actuaries carried out such a survey only after the idea was first proposed by the National Association of Insurance Commissioners.

Note: The Report is available from the Chicago office at a cost of \$5.00. □

The Simple Life

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sumer. Some interesting points are made. One is that in the United States courts of law, it was decided that the cash value of a policy was not subject to distraint (seizure) in connection with unpaid federal income taxes as in the case of savings deposits.

The initial reaction of an actuary to this 30-page pamphlet dated June 1974 and with fifth printing, January 1975, is one of surprise that all this attention is being given to what appears so obvious. The fact is, that if a level yearly premium is to cover a benefit of a fixed amount payable on death with mortality increasing year by year, a fund must be accumulated by the insurance company on which to draw when the cost of the death benefit in later years exceeds the premiums then being paid.

Much attention is given in the report to the "cash surrender value." This is the simple fact of giving the policyholder on surrender of the contract other than by death, a share of the fund which the company must accumulate to carry out its obligations, and which is the basis of the non-forfeiture and loan benefits which are undoubtedly stressed by those selling the plan. Considerable emphasis on this "cash surrender value" is probably apparent in the sales methods used by companies and agents.

I, personally, have often referred to the straight life plan as the Scotsman's Endowment. This was to emphasize the long term nature of the contract and the substantial cash surrender values granted on survival to ages 60, 65 or later, the retirement ages. It stressed the lower premium payable on the Scotsman's Endowment as compared with the corresponding endowment insurance where the sum payable at the retirement age is the same as that payable on prior death.

The splitting of the straight life plan into "pure" insurance (protection) and "savings" elements was particularly stressed by the Insurance Commissioners in their request for a research report. Instead of being regarded as a mathematical exercise, critics stress that this indicates that the amount of insurance protection reduces year by year while the savings element increases, the total just equals the face amount of the

THE ACTUARY'S VADE MECUMS

The Society has provided two *assists* for actuaries called upon to explain their profession, I for general presentation and II for encouragement of actuarial careers.

I

About three times as much material as could be included in the exhibit on actuarial history described in the December issue of *The Actuary* was collected. This factor together with the realization that the exhibit because of the problems of shipping, assembly, and frangibility would at best have limited use, led to the consideration of other ways of mining the gold lode of interesting documents collected.

A 35mm slide film accompanied by a taped narration seemed the perfect answer. The resultant slide presentation, which is independent of the 25th Anniversary Celebration and speaks to all phases of actuarial work, was designed to help answer many of the usual questions about the role of the actuary and the future of the profession. While this show is directed primarily at non-actuaries, it will still be of interest to actuaries, particularly to those whose knowledge of the history of the profession is not very extensive.

The presentation consists of 79—35mm slides along with a 30 minute tape narration in cassette form. The voice is that of a professional radio announcer. Herb Oscar Anderson. The complete set may be rented for a one time use for a cost of \$20.00. Arrangements may be made for purchasing the set at a price of \$100.00.

Interested actuarial clubs, other organizations, and individuals should get in touch with the Chicago Office.

policy. The continuing criticism is to compare the savings with other forms of investment with the cry "Buy term and invest the difference," as if the great majority of purchasers of ordinary life insurance would invest the difference of premiums between that plan and a term to 65 plan. The hope of the fault-finders is that such a procedure would reduce considerably the financial importance of the life insurance industry. Another effect would be to reduce considerably the savings by the population; a serious matter in this inflationary age.

The report does not mention that the existence of guaranteed cash values

II

The Careers Encouragement Committee has developed a Speaker's Kit to help actuaries speaking about their profession to students, vocational guidance counselors, and mathematics educators. Most actuaries in that position will probably rely, to a considerable extent, on their own experience and memory. The Kit provides not only an "assist" but a storehouse of information regarding the profession. The actuary who has an equal store of knowledge at his fingertips is probably not yet born. There is information about the history of the profession, about the varied duties the actuary may be called upon to undertake (including a host of definitions), and comments upon the opportunities for the actuary as well as helpful mathematical illustrations (with slides), simple and complex. There is a broad outline of suggested speech topics to be varied according to the audience. The Kit cannot fail to be helpful to any actuary called upon to address any group, even a group beyond the stage of entering upon an actuarial career.

A Speaker's Kit has been sent to the Chief Actuary of each firm employing a member of the Society of Actuaries, to the President of each actuarial club and to the members of the Society committees directly involved in disseminating information about the profession. Any other member of the Society can obtain a Kit by writing the Chicago office. □

serves as a restraint on the investment policy of life insurance companies requiring a greater degree of liquidity than would otherwise be necessary and that this affects the investment yield.

This research report contains much information which will interest actuaries and others but one wonders whether a simpler line of approach would not have been more desirable to avoid much of the repetition present in the report. The matter of cost comparisons is not touched upon.

Note: A copy of the report may be obtained on request from the Institute of Life Insurance. □

No OASIs

(Continued from page 1)

from the present level to the replacement level of 2.1).

(3) *Mortality Assumptions* — Continued decreases in mortality rates are assumed beyond the year 2000 (instead of the rates leveling off then). Also, lower mortality rates for women at the middle and older ages are assumed for the years before 2000.

In my opinion, the Panel is correct in stating that the official cost estimates contained in the 1974 Trustees Report are probably understatements of the cost of the present system.

I would differ from the Panel with regard to the economic assumptions, because I believe that its 2% differential between wage increases and price increases is too wide. The Panel seems to state that a 1¾% differential would be better than 2%, but I believe that even a 1½% differential is probably too high. I think that consideration of past trends in order to make assumptions for the future is not too pertinent in this instance, because I believe that we have had a permanent economic discontinuity arise in the past few years.

As to fertility assumptions, I do not agree that the total fertility rate (the average number of children born per woman during her lifetime) will decline even further and reach a low of 1.6 in 1980, although I believe that this is possible. Rather, I prefer the assumptions as to the future trend of fertility made in the official cost estimates. As to mortality assumptions, I believe that these are at least equally as good as those in the official cost estimates.

To illustrate the difficulties and uncertainties in forecasting, the Panel points out how population estimates made in 1946 and 1958 with respect to 1975 were so far wide of the mark. Specifically, the Panel states that the range of estimates made in 1946 was well below the actual 1975 figure, while the corresponding range for 1958 estimates was well above the actual 1975 figure (although the lower end of the range was only slightly higher). The population estimates so quoted are apparently those of the Bureau of the Census.

The Panel may not have looked at the population estimates made by the Office of the Actuary in the past, where the

record was somewhat better. The estimates for 1975 made in Actuarial Study No. 46 (1957) showed a range of 215-241 million, so that the actual figure of 223 million was well within the range. This last figure is taken from Actuarial Study No. 27 and represents the estimated actual population for the entire U.S., including not only the 50 states and D.C., but also Puerto Rico and other outlying territories, federal employees overseas and their dependents, other citizens abroad, and personnel on U.S. merchant vessels.

The Report makes an important point in listing the predictability and impact of various elements involved in the actuarial cost estimates. I would take only one exception to its classifications — namely, labor force participation rates, where I believe that the predictability is high for men, even though it may be low for women.

The Panel comments that the present benefit formula, including the automatic-adjustment provisions, is "over-indexed" because increases in price levels enter in twice in the determination of benefit amounts—because they directly affect the benefit table and indirectly affect earnings which are used in the computation of average monthly wage. There is not necessarily a doubling up here, because the weighting in the benefit formula is an offsetting factor. Actually, there will be an almost complete offset, so that there will be no over-indexing, if wages rise about 4% per year and if prices increase about half as much.

The Report points out the sensitivity problem present with the automatic-adjustment procedure. It may be noted that this subject has previously been brought out into the open. The Panel implies that the main causes of this problem are the absolute difference between the rates of increase of wages and prices and the level of these two rates. Probably the most important element is the relative relationship of the two rates of increase. In other words, if prices increase only about half as much as wages, there will tend to be more stability — although by no means complete stability — than if there is a constant absolute difference between the two rates of increase.

The Panel examines several methods of producing a stable benefit structure and concludes that the best approach is to index the past earnings record either by prices or by wages, but with prefer-

ence for the former. In my opinion, indexing by wages is far superior to do so by prices in order to produce a realistic and just result. This can be seen by taking the possible, though unlikely, condition of no price inflation in the future, but with small wage increases. Under these circumstances, taking into account the weighted benefit formula, the emerging benefits will represent gradually smaller and smaller percentages of final pay. This is certainly an unrealistic result from the standpoint of political pressures and social justice.

Certain changes in methodology are suggested, in addition to those previously mentioned with regard to assumptions. In essence, the Panel believes that there could be an improvement in the estimate of merging benefits based on lifetime earnings histories. I would agree that the suggestions are well worth considering, because this particular area has been one of the less strong portions of the cost-estimating procedure. I would, however, be somewhat wary of relying too much on an EDP simulation if it buries all details invisibly on the tapes and only spews forth the final answer.

The Report points out that the automatic-adjustment provisions, which were enacted in 1972, were introduced "to provide a more orderly and timely means of adjusting benefit levels in response to inflation, rather than the *ad hoc* increases voted from time to time by the U.S. Congress." It might have been mentioned that Congress merely put into law on an automatic basis exactly what it had done previously on an *ad hoc* basis and did not develop a completely new methodology.

Because of time limitations, the Panel studied only the OASI portion of OAS-DI. At times in the Report, of necessity, the Panel referred to, and made recommendations for, the combined system. As has been indicated in another current review (by John Haynes Miller), the DI program has had financing difficulties in addition to those arising on account of the benefit structure. It would be in order to suggest that there should be a further investigation of the DI program by a panel of actuaries.

Actuaries should read this report both because of the great importance of the subject matter and because it is an excellent example of how an actuarial report should be presented to the general public. □