



# The Actuary

The Newsletter of the Society of Actuaries

VOLUME 6, No. 7

SEPTEMBER, 1972

## MID-1972 AMENDMENTS TO THE SOCIAL SECURITY ACT

by C. L. Trowbridge

A few but very important changes in the Social Security System were enacted at mid-year in Public Law 92-336. (This Law was primarily directed to the extension of the national debt ceiling.)

The only change in the benefit structure with immediate impact is a general benefit increase of 20%, effective for the month of September 1972, payments of which are first made in early October. Eventually benefits will be further affected by two other important provisions: (1) the increase in the earnings base to \$10,800 in 1973 and to \$12,000 in 1974—as compared with \$9,000 in effect in 1972, and (2) the so-called “automatic” provisions, under which (in the absence of legislative action) the benefit table is periodically increased in step with the Consumer Price Index, and the earnings base is concurrently increased in step with average earnings levels.

Of particular actuarial interest are the changes made in the financing of the system. The combined employer-employee contribution rate for old-age, survivors, disability, and hospital insurance combined was increased from 10.4% in 1972 to 11.0% for 1973 through 1985, with only slightly higher rates for the period 1986-2010. (The rate was scheduled to rise to 11.3% in 1973 and eventually to 12.1% with a \$9,000 base, under the 1971 Amendments.) The new legislation calls for a substantially higher rate beginning in 2011, to reflect the demographic effect of the post-World War II baby boom reaching retirement age at about that time.

(Continued on page 5)

## COMMITTEES

*Editor's Note: This is the third report on the operations of the Society's Committees. Mrs. Rappaport is Chairman of the Fields of Activity Committee.*

by Anna Maria Rappaport

The Year Book defines the function of the Fields of Activity Committee as follows:

“This Committee advises and assists the Program Committee in the design, planning, and presentation of the programs at meetings of the Society. It also examines the adequacy and attractiveness of Society activities to the members and makes recommendations to the Board of Governors.”

The major activity of the Fields of Activity Committee for the last few years has been planning for Society meetings. The Committee membership has been chosen to represent the various activities and interests within Society membership thus covering the interests of the entire membership.

### Objectives of the Committee with Respect to Meetings

1. To evaluate meetings. Comments are collected from the Committee and represent their feelings, and the feelings of others whom they talk to. The Committee is sort of a “grass roots” data collection agency. Included in these evaluations are comments about the format of meetings, use of outside speakers, social activities, success of workshops, etc.
2. To provide a basic source of ideas for future meetings. The Committee is polled with respect to meeting format, social events and topics for workshops and concurrent sessions, and questioned about individuals who have been suggested as outside

(Continued on page 8)

## THE NATURAL RESERVE CONTROVERSY—A BRITISH VIEW

by Anthony P. Limb, F.I.A.

*Editor's Note: We welcome this contribution from across the Atlantic. Mr. Limb is a Joint Secretary of the Scottish Life Assurance Company.*

The author has recently returned from a visit to the United States and Canada during the course of which he had the privilege of meeting a number of actuaries practising in North America and discussing with them common problems and differences of approach. Apart from this experience he has however little knowledge of actuarial practices in North America, and while wishing to acknowledge with gratitude the assistance he received from these actuaries whom he met he readily acknowledges that there may be mis-understandings in his grasp of the situation. For that he alone is responsible.

The methods employed to evaluate the liabilities of a Life Office, and to present the results for public scrutiny, are of prime interest to actuaries and have always been a fertile source of discussion and disagreement. They are also the field in which there is the greatest need for the actuary to display skill, judgment, and responsibility. In Britain at the present time the subject of valuation presentation and approach is, and has for some time been, of concern for at least two reasons. In the first place, a policy of investment in equities and property, which may be pursued in Britain without regulatory interference and has been adopted by a number of Life Offices to the extent of between say 40 and 60% of their assets, has produced large capital appreciation, both realized and unrealized. This capital appreciation

(Continued on page 6)

# The Actuary

Editor . . . . . ANDREW C. WEBSTER      Correspondence should be addressed:  
 Associate Editors . . . KENNETH T. CLARK      *The Actuary*  
                                  PETER L. HUTCHINGS      Mail Drop 8-4, 1740 Broadway  
                                  FREDERIC SELTZER      New York, N. Y. 10019  
                                  EDWARD H. WELLS

Published monthly (except July and August) by the SOCIETY OF ACTUARIES, 208 S. LaSalle St., Chicago, Illinois 60604, Robert J. Myers, President, William A. Spare, Secretary, and John T. Birkenshaw, Treasurer.

The Society is not responsible for statements made or opinions expressed in the articles, criticisms, and discussions in this publication.



THE mention of a quadrennial event in the year 1972 would probably suggest to most of our readers the Presidential election in the United States and many would bewail another addition to the already too high pile of political nonsense. There is however another quadrennial event which takes place in the same year as the Presidential election but which has pleasanter connotations for all attending. We refer to the International Congress of Actuaries, the most recent meeting having been held in Oslo in June. Comparisons being, as Dogberry says, "odorous," we will not draw a parallel between the proceedings at the Congress and the proceedings at the party conventions.

This is not the place to review the topics or the published volumes except perhaps to remark upon the great interest shown in variable life insurance and to wonder if the National Reports are as important as the time spent on them would suggest.

Happenings other than the business sessions may linger longer in the memories of those who attended . . . the reception in the magnificent Town Hall where the crowd of 850 actuaries plus "accompanying persons" was hardly noticed . . . the Norwegian Folklore performance in the National Theatre . . . the orchestral concert in the Hall of the University, a hall with fine acoustics and stunning murals by Edvard Munch . . . the delightful Banquet with no speeches . . . the excellent information services at the Congress . . . the attractive lady attendants always a present help in any trouble . . . the opening and closing session in a magnificent movie theatre with the Congress billed outside as a special attraction . . . at the closing session the stirring performances inside and outside the auditorium by the band of the King's Guards . . . Oslo itself in rain and sun, a pleasant city of pleasant people and public transportation that runs well!

For a successful and memorable Congress we are indebted to our hosts the Norwegian actuaries and particularly to the Organizing Committee under the Chairmanship of Mr. Paul Qvale. To all of them . . .

*Mange Tusend Takk!*

*A.C.W.*

## TO BE CONTINUED

*Editor's Note: This is another in the series of articles from the Committee on Continuing Education. The rule is one article to one subject to give the non-specialist in that subject up-to-date general information and to encourage further research in the subject if the reader is so minded. Comments will be welcomed by the Committee and by the Editor.*

### EDP Software and Services

*by John Kirkman*

Many insurance companies are finding that insurance oriented EDP applications can be put into production faster and at less cost by using the packages and services of EDP software and service companies. To aid in minimizing the initial steps required to analyze what products are available and to learn what companies supply them, the Life Office Management Association (LOMA) has recently published two Systems and Procedures Reports summarizing this information for easy reference.

The purpose of this article is to present the general contents of these reports, concentrating on those areas which should be of particular interest.

A survey of LOMA's committees on Data Processing, Systems Research and Regional Systems Development produced the names of 175 EDP software and service companies with which those insurance companies represented had been in contact. A questionnaire was sent to each of the 175 companies and 81 responded. These responses were used to produce both Report No. 14 and Report No. 15.

Report No. 14, *EDP Software and Service Companies*, is a brief snap-shot of each of the 81 responding companies. The following information is presented for each company in alphabetical order by name of company.

- Address of home office
- Name and title of a person to contact
- Primary business
- Gross sales, number of employees and years in the business

*(Continued on page 3)*

## EDP

(Continued from page 2)

- Application categories (25) in which packages are available
- Number of life insurance users for services in education, consulting, facilities management, and time sharing.

Report No. 15, *EDP Software Catalogue*, provides the means of looking up those companies which provide packages in a particular area of application. This report is arranged into the 25 application categories. Under each category, applicable EDP packages are listed in alphabetical order by name of package with vendor. Information for each package includes price, system requirements, a brief description of the package, and a list of the names of those insurance companies (when available) currently using it. The last item is particularly valuable in that user reactions and comments can be polled without contacting the vendor directly. Other information offered, when available, included program language, facts on installation, maintenance documentation, trial periods, etc.

Categories of particular interest to actuaries are listed below. (Although the same packages can appear in more than one category, the number in parentheses indicates the number of packages covered in each.)

- Individual Insurance—Life (38)
- Individual Insurance—Health (24)
- Individual Pension (18)
- Group Insurance—Life (5)
- Group Insurance—Health (6)
- Group Pension (9)
- Variable Annuities (6)
- Actuarial and Statistical (30)
- Corporate Modelling (19)
- Natural Reserves and Adjusted Earnings (8)

Life Insurance Companies not members of the Association may obtain copies from the Association at the following prices: No. 14 \$10.00, No. 15 \$25.00. □

## BOOK REVIEW

Barnet N. Berin, *The Fundamentals of Pension Mathematics*. Actuaries Club of New York, pp. 125, \$12.50.

by Frank L. Griffin

The Fundamentals of Pension Mathematics was developed by Mr. Berin from notes made in conjunction with a series of lectures he gave under the sponsorship of the Actuaries Club of New York. The result is an interesting, highly practical, modern handbook for pension actuaries in the computer age, a fitting supplement to the classical pension mathematics on which actuaries were trained a generation or more ago. While the book does not deal directly with the science of computers Mr. Berin's approach relies for its practicability on the use of computers in making pension valuations thus reflecting the much greater scope available to the modern actuary.

As it should, Mr. Berin's "Fundamentals" lays considerable stress on the computation of actuarial gains and losses (by source), not only as a check on the individual actuarial assumptions but also as a means of reconciling changes from one valuation date to the next. The author points out that the gain and loss analysis gives the actuary greater confidence in the accuracy of the valuation, pinpointing any errors, and provides authoritative answers to questions posed by employers, unions, accountants, and others relative to the reasons for changes in pension costs. The subject of gain and loss is worked into the discussion of funding methods, where it logically belongs. As has been pointed out by a number of actuaries (notably Trowbridge), an actuarial funding method is not fully defined "until a mechanism is established for recognizing differences between actuarial assumptions and actual experience." Mr. Berin has provided the mechanism.

The author goes beyond the pension mathematics alone, delving into tax deductible contributions, presentation of valuation results, role of the actuary in multi-employer pension plans, deposit administration dividend formulas and an introduction to variable annuities. In short, he covers a great deal of ground which will be of practical value to those who enter the pension field.

As might be expected in a text designed for instructional purposes, espe-

cially one intended to provide an overall orientation for the student, the author has furnished a clear map to guide his charges through the forest while leaving them to study the individual trees on their own initiative. He has furnished the breadth; the depth is up to them. Exercises accompanying each chapter are well chosen to test understanding of the principles.

The opening chapters deal with standard methods of funding pension liabilities, methods of valuing assets, and the determination of gains and losses separately for assets and liabilities. Each funding method is handled in relation to the method of spreading (or recognizing immediately) the gains associated with such funding method. Later chapters provide a discussion of the valuation of ancillary benefits, tying together the valuation results, evaluating the significance of gains or losses, changing the actuarial assumptions and possibly funding methods, and other miscellaneous matters of interest to the practicing pension actuary.

Most actuaries in the pension field are aware that for several years a debate has been going on relative to the preparation, under the aegis of two of the principal actuarial bodies, of so-called "principles and practices" (or "guidelines") for the valuation of pension plans. In a limited sense, Mr. Berin has written such a work. It is not couched in the language of a "guideline" and has no official sanction. Those who have urged official sponsorship of such a project have cited a supposed need for "policing" within the profession itself, in order to avoid such a function being taken over by persons outside the profession. Those who have opposed it have, for the most part, taken the position that a professional is distinguished by the exercise of judgmental factors; in other words, an actuary qualified by education and experience should be considered the best judge of what is appropriate for the valuation of a plan under a given set of circumstances. Mr. Berin's approach to the Fundamentals of Pension Mathematics indirectly suggests there may be a middle ground between these views, possibly further extension of the Opinions issued by various actuarial bodies in clarification of their guides to professional conduct.

(Continued on page 8)

LETTERS

Examinations

Sir:

The editorial in the May issue of *The Actuary* covers a topic that usually generates lively discussion among actuarial students.

I agree that improvement is possible in the first five exams. For example, Part One is superfluous since a similar degree of mathematical knowledge is required for Parts Two through Four and an earlier knowledge of life contingencies, especially single life functions, is necessary before an actuarial student can become involved with the more interesting actuarial problems.

I would not like to see Part Five dropped from the Associateship exams because I do not think a person should be granted Associateship without a knowledge of the techniques necessary for conducting mortality investigations.

In summary, I think a considerable improvement in the Associateship exam syllabus can be made by dropping Part One, bringing life contingencies into an earlier exam, and abbreviating Part Five.

Laurence D. Cohen

\* \* \* \*

Sir:

I strongly agree with your May editorial advocating that the Part III exam be composed of Compound Interest and Basic Life Contingencies. You mentioned the advantage of getting students into life contingencies earlier. I believe there are other advantages:

(1) This exam would correspond to Part III of the Casualty exams.

(2) Because many college courses do not come up to Part IV standards the new exam would be better for students writing in college and for the colleges trying to prepare actuarial students.

Numerical Analysis could perhaps be moved in with Graduation in Part V, with Risk Theory or Demography moved to Part IV. The only real disadvantage of the change would be the inconvenience involved in the changeover.

David M. Millward

\* \* \* \*

Confounding Interest

Sir:

Have any of your readers been confused, as have I, by the recent rash of newspaper ads by New York Savings Banks announcing their new effective annual yield of 6.27% corresponding to a 6% nominal rate (similar yields for other rates such as 5%)?

The ads variously describe the new yields as based on continuous or daily compounding and ascribe them to new Federal regulations regarding methods of compounding.

Using the usual actuarial functions, I made some checks on my own. On a continuous basis the best I could do was 6.18% (carried to four decimal places it was 6.1837%). On a daily compounding basis it was still 6.18% (and this was apparently the maximum legal yield I had previously seen advertised by some savings banks). I experimented a bit and found I could get the 6.27% yield by using the formula

$$\left(1 + .06/360\right)^{365} - 1$$

that is, assuming 1/360 of the nominal rate for each day's accrual of interest.

This interpretation seems to be borne out by Part 329 Section (e) of FDIC regulations dated May 12, 1972, which states: "In computing interest on time and savings deposits the time factor should be expressed as a fraction in which the actual number of days the funds earn interest is the numerator, and the denominator is either 360, 365, or, in a leap year 366. . . ."

The permitted use of a 360-day basis is apparently the key to the difference between the 6.18% and 6.27% yields.

A. A. Gruson

\* \* \* \*

Sir:

The traditional bank practice of charging interest on the basis of 360-day year is now being challenged in the courts. Cases are pending against one bank each in Illinois, Oregon, and New York and against 3 banks in California.

Noteworthy is the fact that 2 of these suits are class actions which could lead

to damages in the millions of dollars. (See article "Law Suits Challenge Practice of Banks of Charging Interest on 360-day Year" by Elizabeth M. Fowler, *New York Times*, July 31, 1972.)

While this method of computing interest results in higher charges to borrowers the reverse is true for depositors who receive greater yields in the savings banks that have recently switched to the 360-day basis for paying interest as Mr. Gruson points out above.

Frederic Seltzer

\* \* \* \*

Definitions

Sir:

Here's an addition to the definitions of an actuary:

A senior Actuary is a person who can prove statistically that the examinations were easier the years before and the years since he took them.

Ralph E. Edwards

\* \* \* \*

MALTHUS UP-TO-DATE

*Population and the American Future: The Report of the Commission on Population Growth and the American Future.* Signet Books (Paperback) New York 1972, \$1.50.

This Report, which will be the subject of a lecture at the Society's Fall Meeting, is the end product of a massive study by a special commission set up in 1970.

On its publication the Report received widespread (but fleeting) notice, mainly because of the recommendations for broad and practically unrestricted birth control and legalized abortion. More or less ignored were the analyses of the general aspects of population growth—e.g., the number of people, the effects upon the nation's economy, the effects upon the environment.

The Report is recommended reading. It is well written, interesting, and important and should not be permitted to be the victim of political neglect.

Note: A more detailed review prepared by A. M. Niessen will appear in the *Transactions*. □

## Amendments to Social Security

(Continued from page 1)

The actuarial methodology behind the contribution schedule for old-age, survivors, and disability insurance is a substantial departure from the past.

The methodology employed prior to enactment of the automatic provisions has been based on two static assumptions: (1) that of an unchanging law, and hence an unchanging benefit table, and (2) that of an unchanging level of earnings.

With the enactment of the automatic provisions, the unchanging law assumption is no longer an assumption of static benefits. In the absence of further legislation both the benefit table and the earnings base will rise if, as must be expected, consumer prices and earnings levels rise. Dynamic assumptions as to benefit and earnings levels become appropriate when automatic benefit table and earnings base increases are included in the law.

The actuarial methodology and long-range assumptions behind the new contribution schedule differ from the traditional social security methodology in these three important respects:

(1) The benefit table in the statute is assumed to be adjusted periodically, in accordance with automatic provisions of the new law. For this purpose the CPI is assumed to increase at  $2\frac{3}{4}\%$  annually.

(2) The level of taxable earnings per covered worker is assumed to increase at the rate of 5% annually. This is equivalent to the assumption that average earnings increase at 5%, and that the earnings base increases (as it would under the automatic provisions) at this same rate.

(3) As a provision against all of the various ways in which the long-range cost estimates may prove to be optimistic, and especially against the possibility that the gain in wages in constant dollar terms may fall below the  $2\frac{1}{4}\%$  (i.e.,  $5\% - 2\frac{3}{4}\%$ ) per year assumed, a special margin has been built into the cost estimates. This contingency margin is of such size that a CPI increase of  $3\frac{1}{8}\%$  (instead of the  $2\frac{3}{4}\%$  assumed) could be experienced, without inadequacy in the

financing, if all other assumptions worked out exactly. Alternatively, it is also of such magnitude that after eight years an additional 3% benefit increase could be enacted without change in the contribution rates, if in fact all assumptions had worked out exactly, and the contingency margin had so far proved to be unneeded.

The resulting costs as a percent of payroll for old-age, survivors, and disability insurance are lower than under the traditional methodology, although the differences are not significant for the near future. These lower projected costs are based on the premise that additional financing will be provided if Congress should enact benefit increases beyond those coming from the automatic provisions.

It is perhaps worthy of comment that the automatic provisions now a part of the law, under realistic assumptions as to the relationship between rates of price and earnings increase, result in average benefits rising slower than average taxable earnings; and hence in some deterioration of the average benefits/earnings ratios. Future legislative action that might be deemed desirable to avoid such deterioration would require additional financing.

Another feature of the OASDI financing is worthy of note. The 1971 Advisory Council on Social Security recommended as a goal that the trust fund assets be maintained at approximately the level of the following year's expected outgo. At the end of 1971 this ratio was very close to 100%, but the enactment of the 20% benefit increase means that the 1972 ratio drops to 84%, not because of any decrease in the fund over 1972, but because of the large increase in the following year's outgo. The contribution schedule in the new legislation is sufficient to provide substantial trust fund growth over the next five years, but it is not sufficient to restore the fund outgo ratio to 100% until about 1990.

The enactment of the new legislation had a very healthy effect on the actuarial status of the Hospital Insurance Trust Fund. The benefits were not changed, but the financing was increased, not only by the two-step increase in the earnings base, but also by an increase in the contribution rate. The actuarial deficit noted in the last Trustee's report was

made whole, and the projections for the HI Trust Fund show that within five years the fund will be over 100% of the following year's projected outgo, as compared to less than 50% at the end of 1971.

The new legislation adequately finances the benefits provided by the system. The contribution schedule, devised by the Office of the Actuary and incorporated into law by legislative action, has been tested against the cost estimates calculated in accordance with the new methodology involving dynamic assumptions, and future income and future outgo are in close balance. The new methodology, proposed by the 1971 Advisory Council on Social Security, later adopted by the Office of the Actuary and endorsed by the Boards of Trustees, has now been accepted by Congress.

Although the financing of the system is entirely adequate from a trust fund point of view, and while substantial trust fund growth is expected, the new legislation does have an adverse effect on the unified budget for fiscal 1973. Additional outgo starts in early October, whereas the higher contribution rates are not effective until January 1973; and the effect of the higher earnings base will not be felt until the early part of fiscal 1974. □

### Social Security Notes

Daniel F. Drennan. *Railroad Retirement Disability Program, 1937-71*, pp. 42. Railroad Retirement Board, Actuarial Study No. 10, June 1972.

This report presents in a concise and highly readable manner a great deal of information on the history and current status of the principal disability retirement program for the nation's railroad workers. The actuarial part of the report includes rates of disability retirement, the mortality experience of disability annuitants, and the latest annuity tables used by the Board. Special attention is called to certain features of the program which have a strong bearing on mortality rates in the first duration since retirement. Finally, there is a comparison with certain other programs including those operating under group insurance contracts.

Free copies of the study may be obtained by writing to the Office of the Chief Actuary, Railroad Retirement Board, Chicago, Ill. 60611. □

## Natural Reserve

(Continued from page 1)

forms a significant part of the total investment return obtained from investment in equities and property and, if equity is to be preserved, an appropriate part of these sums should go to existing policyholders (whose funds were used in making the investments) and the rest used as an investment in new business and to hedge against future capital losses by the setting up of appropriate investment reserves. However, using a modified or unmodified net premium valuation it is possible to use capital appreciation only by a specific decision to treat part of the sums involved as income, by means of a specific transfer to the revenue account—such transfers are permitted in Britain—and, in view of the volatility of common stock prices, it is not easy to be confident how much of the appreciation can thus be used at any given time. Secondly, conservatism in making these transfers has indirectly exerted a restraining influence on the amount of new business written, since substantial new business strains are incurred under the conventional valuation presentation, which employs a rate of interest substantially below that assumed in calculating the premiums. Thus questions of equity and of expansion have combined, together with the investment policy followed, to cause some offices to depart from the traditional net premium valuation presentation.

In Britain there is a much greater degree of freedom of manoeuvre open to the actuary. There is no statutory maximum valuation rate which may be employed, and, for ordinary business, no prescribed tables of mortality or other constraints operate. In North America, where there is a well-developed regulatory framework within which the actuary must operate, the question of appropriate valuation bases and the presentation of results has arisen in recent years, the author understands, for other reasons.

The movement towards presenting the valuation results on a natural reserve basis can be traced to the interests of shareholders in stock companies. If a proprietary company expands rapidly, using premium rates which may well eventually produce a substantial profit for the office, the strait jacket of the statutory valuation basis — or of the office's customary valuation basis, which may be even stronger—produces a re-

duced, if not a negative net gain from operations. A sequence of such results combines to depress the stock price. The proponents of the natural reserve presentation school, argue that it is appropriate to value new business—and existing business—on a basis closely approximating to the premium basis on which the business was issued. This, they say, will properly reflect the emergence of profit or loss. It will also mean of course that if a large body of new business is written in any particular year, earnings as presented on this natural reserve basis will not be significantly different from those which would emerge had no new business been written in the year. It is assumed, naturally, that the statutory reserve basis will continue to be mandatory as an alternative presentation, so that, although the net gains from operations when presented on that basis would doubtless look uninspiring to the shareholder, he would be able to examine the natural reserve basis presentation and see a truer picture of the financial position of the office. The maintenance of the statutory reserve basis will, provided a suitable surplus is maintained, ensure that the office is properly solvent.

In essence the problems facing British and North American actuaries in this matter seem to be similar. The question is whether or not the reserve basis is adequate to enable the Office to fulfill its promises to pay under all save the most extreme circumstances, with the added proviso that, under normal circumstances, the presentation should not be such as will conceal a deterioration in the insurer's position which would eventually require violent remedial action. The author would like to question the significance of the surplus percentages revealed by North American offices. It is the case that the nominal value of the assets is in excess of the reserves required, and that the reserves required are adequate to meet the liabilities provided that the valuation rate of interest is obtained on the reserves and subsequent premiums received, and that experience is in all respects as postulated by the valuation basis. It is also the case, the author understands, that reserves are adequate to cover cash values. However, since the nominal value of the assets is in general in excess of the market value of the assets, which is what would be required if mass surrender were to occur, and since there is no formal test of the appropriateness of the asset distribution by

date as compared with the liability distribution by date, and since, as far as the author is aware, little work has been done to determine what margins should be held to cope with statistical fluctuations about expected experience, the significance of any particular level of surplus is somewhat in doubt. The position in Britain is in some respects similar, but there is a legal requirement not to value assets at a figure in excess of the market value thereof. The author's point is that if the significance of existing surplus is in some doubt, any method of presentation which permits over rapid new business expansion may lead more quickly to the point where surplus is in fact inadequate.

It would appear to the author that there is a risk that the following sequence of events, perhaps spread over many years, may occur. In the first place, the natural reserve basis will be adopted for proprietary companies and presented in parallel with the statutory reserve basis. This will probably permit and encourage more rapid new business expansion than might otherwise be the case. The author does not mean to suggest, of course, that new business expansion should be suppressed unduly, he is merely concerned to point out that new business expansion does not generate immediate accretions to surplus, and surplus must be kept at an adequate level. Second, the policyholders of mutual companies will demand that they also present their results on a modified basis in addition to the statutory basis. This will lead to assertions that mutual companies have huge and unnecessary reserves and should increase their dividend scales promptly and significantly. It may also lead, of course, to taxation on the alleged surpluses thus revealed. Thirdly, a school of thought will emerge which will assert that, since we have for many years been obtaining rates of interest on new investments substantially above the maximum statutory permitted rate, and since companies both stock and mutual have for some time been presenting results on the natural reserve basis in addition to the statutory basis, and are selling new business on the natural reserve basis which they must therefore believe to be profitable in the long run, therefore, the statutory reserve basis should be abandoned as being quite absurdly strong and a ridiculous brake on new business expansion and dividends both to shareholders and policyholders.

(Continued on page 7)

## Natural Reserve

(Continued from page 6)

Now the customary valuation bases either are too strong, or they are not. If we assume for the moment that they are not, then no matter what other presentation is adopted for the revenue account, additional reserves, no doubt capital reserves, must by hypothesis be set up and added to the reserves shown in the revenue account under a weaker basis so as to produce a reserve which in total is equivalent to the reserve presently set up. If additional reserves of a capital nature are set up in this way, then neither new business expansion nor dividends to shareholders or policyholders can move ahead any more rapidly than they can under a conventional presentation system, properly managed. If on the other hand, the statutory reserve basis is too strong then of course it should be weakened and some other reserve basis put in its place. This is the situation which would emerge if the sequence of events outlined in the preceding paragraph were to materialize.

The question which has to be answered therefore is simply this: are conventional valuation presentations too strong or are they not? As soon as the question is posed we must admit that we do not know the answer. We do not even know if the conventional reserve basis is strong enough, though there would I submit be almost universal agreement that it is for most contracts. If therefore we weaken our valuation bases we are moving from a framework which we are fairly confident gives us a satisfactory probability of being able to redeem our promises to pay, to a framework under which that probability is weakened to an extent which cannot be quantified. A move to the natural reserve basis in essence implies that we substitute in our valuation basis a rate of interest which is our best estimate of future experience for one which, we are fairly sure, is an underestimate of future experience, but not, for all that, inappropriately strong.

If such a change is made, there would undoubtedly be a short term gain to shareholders. For this purpose however, the weakening of the life fund seems too high a price to pay. The author realizes of course, that a change on the part of stock companies to the presentation of valuation results on a natural reserve

(Continued on page 8)

## Society Examinations-Seminars

### GEORGIA STATE UNIVERSITY

Seminars for Parts 5 and 7 will be held during the week of October 16-20.

Complete information can be obtained from

#### GEORGIA STATE UNIVERSITY

Insurance Department

33 Gilmer Street, S.E.

Atlanta, Georgia 30303

Telephone (404) 658-2725

### NORTHEASTERN UNIVERSITY

A four-week seminar for Part 7 begins October 16 and ends November 9.

Five-week seminars for Parts 9E and 9I begin October 2 and end November 3.

Complete information can be obtained from

#### DEAN GEOFFREY CROFTS

Graduate School of Actuarial Science

Northeastern University

360 Huntington Avenue

Boston, Massachusetts 02115

Telephone (617) 437-2696

## Actuarial Clubs

*The Actuary* is unable to publish announcements of the newly elected officers in the various clubs. Such information should be sent to the Chicago office for publication in the *Year Book*.

*The Actuary* is glad to publish announcements of the meetings of the clubs. Secretaries should note that notices of meetings should be in the hands of the Editor at least two months prior to the date of the meeting. *The Actuary* would like to have reports of topical discussions at club meetings. Several of these have been worthwhile contributions to the Newsletter.

## Actuarial Meetings

Sept. 13, Baltimore Actuaries Club

Sept. 21, Hartford Actuaries Club

Oct. 12, Baltimore Actuaries Club

Oct. 23, American Academy of Actuaries, Annual Meeting, Bal Harbour, Florida

## POPULATION DYNAMICS SYMPOSIUM

by John A. Beckman

There is a growing trend to partially describe population dynamics through new mathematical models using probability, statistics, differential equations, and other branches of mathematics. In June this year, the Mathematics Research Center of the University of Wisconsin sponsored a symposium on Population Dynamics devoted to such models. The symposium provided an opportunity for exchange of ideas among demographers, mathematicians, actuaries and sociologists. It was organized by a committee consisting of T.N.E. Greville (Chairman), Nathan Keyfitz, Louis B. Rall, Karl E. Taeuber, and Halliman Winsborough. All of the committee members are professors at the University of Wisconsin, except Mr. Keyfitz who is a professor at Harvard University.

Some of the lectures could be of real interest to actuaries and so this note will give a thumbnail sketch of several of the talks. Professor Keyfitz presented a paper on "Oscillations in a Demographic-Economic Model." One of his applications showed how better mathematical models could provide school administrators with superior facilities for future planning.

Jan Hoem, Director of the Central Bureau of Statistics of Norway, discussed stochastic process models for marriage dissolution, number of children, and human reproduction. Professor Paul Handler, University of Illinois, presented a synopsis of a way that the computer can be used to dramatically change teaching methods in demography. A student can select any country and in seconds obtain the age distribution of that country, and its population projections under existing conditions or with changed fertility rates, and mortality rates. The projected age distributions can be used to study: (1) cost of education; (2) demand for food; (3) labor force; (4) cost of social services.

The 14 papers will be published as a book by Academic Press and will appear towards the end of the year. □

## Book Review

(Continued from page 3)

This question was the subject of a panel discussion at a recent meeting of the Society of Actuaries. Some actuaries have opted for greater disclosure in actuarial reports, not only as a substitute for "guidelines" but also as a road to better understanding of pensions on the part of the public, perhaps minimizing the need for restrictive regulation. This reviewer infers support by the author of this book for the principle of more adequate disclosure in valuation reports and possibly in pension funding matters generally. The author's position relative to the education of plan sponsors on matters of gain and loss suggests such a stance. Mr. Berin certainly is aware of objections to expanded reports which critics have raised. He cites the usual arguments—"not understood by, or of too little interest to, employers," "too time consuming and expensive," and so on. He dismisses these arguments in the case of the gain and loss analysis.

If it is practicable and constructive to communicate a gain and loss analysis, one might ask whether it is not also practicable to disclose other, conceptually simpler, items in order to contribute to better public understanding. Computerized valuations have introduced a brand new ball game in the informational field. Expanding reported details would be time consuming to a degree. Yet, if limited to items which the actuary knows to be available and *meaningful*, it could be less time consuming to program a computer to provide the information than to compile reams of virtually meaningless reports designed by well intentioned public servants—which seems to be the direction in which we are heading. As for making things understandable (even interesting!) to clients, the challenge this presents is hardly new. Mr. Berin points out most consultants *are* consultants because of that challenge.

A clarification might be in order on page 87 of the book, where the author advises against double-valuations "as a regular procedure" (i.e., valuations based on the plan's regular assumptions and funding method, as well as on alternate assumptions and method). We suspect he had in mind discouraging somewhat arbitrary changes in valuation bases on the part of employers who want "the best of all possible worlds" from year to year if shown too many alternatives.

We are confident he did not intend a proscription against providing plan sponsors with meaningful information relative to such matters as "benefit security of plan participants by class," "status of funding *vis-a-vis* 'close out' rates available from insurance companies," "tests of fund yields needed to overcome inflationary pay increases," and a variety of information which may be found useful in particular situations.

The author might someday wish to consider expanding *The Fundamentals of Pension Mathematics* to a more comprehensive, self-sufficient text, a "bible" of actuarial techniques and procedures for pension plan valuations.

Berin's book is timely, and one can feel greater confidence in the pension actuary of tomorrow if he has been brought up on such a training diet.

Setting aside minor flaws which could be corrected by simple editorial changes, Mr. Berin's book renders a substantial service to actuaries—hopefully to those of long standing as well as to the students who will be representing our profession in the future. □

## Committees

(Continued from page 1)

- speakers, etc. The Committee welcomes suggestions and comments from all Society members.
3. To provide a source for suggested workshop leaders and panelists. The list polled for workshop leaders and panelists also includes individuals who are not on the Committee. In addition to the Fields of Activity Committee members, a number of other Society members are asked to suggest program participants.
  4. To assist the Program Committee in planning the meeting, and in recruiting the panelists and workshop leaders.

## How the Committee Functions

The Committee is polled by mail both for meeting evaluations and for suggestions about future meetings. (Suggestions are also welcomed on any topic and need not relate to meetings).

A designated Committee member collects all suggestions and collates them. The Chairman and Co-Chairman of the

Committee, and usually three other Committee members, become part of the working group of the Program Committee for a given Society meeting, and work together with the Society Vice Presidents responsible for the meeting.

## How a Society Meeting is Planned

The Fields of Activity Committee collects evaluations of past meetings, together with suggestions for the current meeting and submits these to the Working Group of the Program Committee for the particular meeting. The Working Group is composed of two Society Vice Presidents, the Executive Director of the Society, the Fields of Activity Committee representatives, and a local arrangements representative. On the basis of the ideas submitted, the Program Committee prepares the program. The program is balanced to include topics of interest to various segments of the membership. "Hot" current topics are included and topics which were very popular at recent meetings may be repeated.

The program outline is then mailed to the Fields of Activity Committee and to a number of other Society members for suggestions as to participants. A list of suggested persons is compiled and the Working Group meets to select panelists and workshop leaders from this list. The Fields of Activity Committee is responsible for getting in touch with the moderators and workshop chairmen who in turn get in touch with the panelists and the co-chairmen. The moderators and the chairmen develop the final program content and the finished program is sent to the Society's office for distribution.

The Committee welcomes comments on past meetings and suggestions for future programs. These should be sent to Mrs. Rappaport or to the Vice-Chairman, Richard S. Robertson. □

## Natural Reserve

(Continued from page 7)

basis, whilst at the same time retaining the traditional presentation on the bases within the statutory limits need not necessarily lead to the extreme situation described in this article. He has been concerned only to point out the danger which seem to him to exist should any significant weakening of valuation bases take place, and to contrast these with the slender and possibly transient advantages of such a course. □