



The Actuary

The Newsletter of the Society of Actuaries

VOLUME 6, No. 10

DECEMBER, 1972

TIME SERIES ANALYSIS AT WATERLOO

by David G. Halmstad

The Society's Committee on Research and the Department of Statistics of the University of Waterloo jointly sponsored the seventh of the Committee's annual Research Conferences on September 28-30, 1972 in Waterloo, Ontario.

This year's topic, Time Series Analysis, covered the more recent advances in statistical analysis of time series, particularly in economic data. While actuaries are accustomed to the use of forecasts of economic series (such as the level of interest rates), remarkable progress in statistical analysis of such series has not received actuarial attention.

Professor George C. Tiao of the University of Wisconsin introduced the participants to Box-Jenkins time series methods and models, and did so in exceptionally clear and direct style. Robert B. Miller, also from Wisconsin, followed with several case studies of actuarial data, including indices of paid claim costs and frequencies. Frank Reynolds of the University of Waterloo added case studies of life insurance data for cash flow and insurance sales series. Richard Ziock and Jack McGuinness also discussed the role of time series analysis and forecasting in insurance.

Eugene F. Fama of the University of Chicago discussed his recent and important work on the balance between risk and return within the efficient market theory. The importance of Prof. Fama's portfolio model work was supplemented by a recent study by Der-Ann Hsu, now at Princeton University, on the behavior of stock prices. James C. Hickman added some important comments on long-term interest rates, and Messrs. Ziock and Reynolds added studies of bond and

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To All Our Readers,
A Happy New Year!
The Editors

INSURANCE SALE NEEDS SALESMAN

by Thomas Mitchell

Life insurance will continue to be sold on a one-on-one basis between the client and salesman, according to the panel at the annual meeting of the Actuaries Club of Indiana, Kentucky, and Ohio, held on October 4, in Fort Wayne, Ind. Ralph Waldo, President of Columbus Mutual Life, Richard Phillips, Agent for Fort Wayne for Lincoln National, and Charles Williams, FSA, comprised the panel on the future of life insurance marketing.

Mr. Phillips stated that the agent's job was to communicate and explain ideas, not sell policies. The industry is not able to keep enough good agents. Even with the elaborate testing, there are still unknown factors. The agent's basic earnings are from first-year commissions, which creates problems for the agent in servicing policies, especially after a long time in the business. A successful agent eventually needs a partner and clerical help.

Mr. Phillips was enthusiastic about the trend to a corporate form of life insurance shop. A corporate form creates a value to the agent's estate through the redeemable net worth of the corporation. To the client, it offers continuity of service. It is a good way of bringing new men into the business. The old practice of the general agent assigning orphaned business to new agents does not create as strong a relationship.

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ACTUARIAL EXAMINATIONS IN THE PHILIPPINES

by R. L. Bergstresser

In *The Actuary*, April, 1969, I submitted a short article about the Actuarial Society of the Philippines and its activities. Up to that time, the ASP had no program of examinations, but recognized membership in foreign actuarial bodies, or else evaluated a person's college actuarial studies and practical experience as a basis for membership. In 1969 we embarked on a formal program of our own exams, leading to Associateship and then to Fellowship.

One basic decision was not to require an exam in the basic mathematical subjects, e.g., General Mathematics, Accounting, Probability, Statistics, Finite Differences, and Compound Interest. We decided to list these as recommended foundational subjects, which the applicant would need in order to pass our exams in Life Contingencies and in Construction-Graduation. Some applicants with practical experience in actuarial work may have sufficient background in these subjects to take the exams mentioned; others may have to take some college courses for the necessary background. We felt also that with our small membership our members' efforts would be fully occupied in developing a study-examination program for the later exams. Our exams on Life Contingencies and Construction-Graduation will reveal whether or not an applicant is equipped with the basic mathematical knowledge.

Our formal examination requirements for Associateship consist of two exams:

Part 1: Life Contingencies, including continuous functions of compound interest.

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The Actuary

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EDITORIAL

ONE introduction to the subject of Committees is to quote the definition from the pages of a reputable dictionary. (Webster for choice?) Another way is to point out that "committee" is a collective noun in itself and then to ask or suggest a collection of Committees. There are those who would propose a "chatter" of Committees, even a "gaggle" of Committees, an "inanity" of Committees or "uselessness" of Committees. (No prizes are offered for other suggestions).

Some other than dictionary definitions exist. There is the cynic's definition: "A committee is a group of persons who individually can do nothing and who collectively decide that nothing can be done." A more modern version: "A committee is a group which drowns in the shallows while trying to research something in depth."

The thought of Committees was provoked by the Secretary's report of December 15, the which we trust, every member of the Society will faithfully "read, mark, learn, and inwardly digest." In the report there are brief chronicles of no fewer than twenty-two Committees. Never was so much useful work reduced to so little space and never were so many lights hidden under bushels. The appropriate term for the list might well be "A Pride of Committees." The members of the Society can well be gratefully proud of the past work and future tasks of these Committees.

Members of the Society will be interested in the reports of those Committees whose work is in their special field but a review of the reports shows that by a large majority, the Committees are concerned with matters of general interest. Maybe first on the list is the Education and Examination Committee and the Advisory Committee with the report on the restructuring of the Fellowship Examination.

This is a major change and a welcome one. We cannot expect our students to know all about everything (Heaven forbid!) but the competent actuary should have good grounding in all facets of actuarial science.

Part 8a of Mr. Fibiger's outline, "Investments and Valuation of Assets" is intriguing. There has been much comment on the absence of actuaries in the investment field and the absence of investment education in the Society's Syllabus. Now the Syllabus seems to be catching up with events. Actuaries in the pension field have had to concern themselves with investment performance and the introduction of variable annuities and variable life insurance seems to demand of the company actuaries some skilled knowledge of investments. This extension is to be welcomed and possibly the future will call for even greater investment skill on the part of the actuary.

There are many other committee reports deserving of note but space does not permit. We hope that the other chairmen will excuse us if we mention but one other report—that of the Committee to Cooperate with Governmental, Demographic, and Statistical Agencies. This Committee has established relations with at least two important Government bodies and this will help to make the Society and the work of the actuary better known.

We salute "A Pride of Committees"!

A.C.W.

LETTERS

Kelso's Second Income Plan.

Sir:

About the turn of the century, someone published an algebraic proof of a theorem which went unchallenged for some years. Then, some stupid person substituted numbers and, lo, the theorem wasn't true. Thereupon, the "proof" was examined and the error discovered.

Perhaps a similarly naive approach will discredit the "second income plan" described in Mr. Veit's article in the October issue.

1. We must assume, that the scheme is not supposed to . . . (i) decrease the earnings of the existing stockholders or dilute their equity, (ii) decrease the cash pay of the employees, or (iii) decrease the taxes paid government. The first would amount to confiscation. The second would have to be involuntary to work on any large scale and would reduce current spendable income for quite a while just as voluntary private saving does (many economists, or such like, were unhappy in recent times when an increased percentage of the population went on a "savings spree"). The third just cannot be unless the government drastically reduces its spending. Such an action would abolish the jobs of many of those now producing the goods or providing the services for which the taxes are being spent. Only in the wildest imagination can this appear possible. The cost could be financed by a substantial increase in the rate of inflation with greatly increased taxes used to finance this redistribution of wealth.
2. A very large part of the population does not work for any stockholder-owned corporation. For them, this version of syndicalism would have no direct applicability.
3. There are many manufacturing operations and service facilities which do not need significant expansion. do not have data to substantiate naming any, but surely the railroads are in this category.

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Letters

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4. The ratio of capital to payroll varies greatly by industry as does the investment yield rate in excess of the interest rate on indebtedness. Therefore, even if it would work, the scheme would have very uneven effects on those to whom applicable. A recent issue of *Business Week* shows that, for the year ending September 30, 1972, the composite return on common stock equity of 9 large railroads (not including Penn-Central) was only 5.6% even though several of these have diversified. Similarly, the average return for 22 large steel companies was only 4.7%, while for the large and very important category of public utilities, the composite of 45 large companies, including A.T.&T., was only 10.5%. This scarcely jibes with the statement in the article that "In well-managed businesses new capital assets will generate enough income to pay for themselves within a few years."
5. Any corporation which believes that expansion will increase its profitability by more than the cost of borrowing the necessary capital can now do so if it can find a lender who agrees. This proposed scheme would finance an expansion with the cost of paying the interest and redeeming the loan being borne principally by the existing stockholders with most of the profit plus the amount of the loan going to the employee-beneficiaries of the trust. The statement in the article that there would be a lower after-tax cost to the corporation (meaning, I trust, the owners before this maneuver) than traditional borrowing is untrue, although, if it reduces earnings it will reduce taxes!
6. No lender would or should make a loan secured only by common stock for 100% of its value (except maybe a minor loan to enhance the lender's "social image"). As a minimum, the cost of paying the loan and interest thereon would have to be a prior lien on the assets and earnings of the corporation.

It is recognized, that there are corporations which have profit-sharing or "thrift" plans with much or perhaps all of the fund invested in the company's stock. They presumably believe that such plans do not appreciably increase their costs, due to lower cash wages and/or increased productivity. In selected instances this is no doubt true, but I am confident that they have limitations and termination provisions, and I believe that such plans are better regarded as devices for accumulation of estates or retirement income than for "second income."

Except by inheritance or by winning a lottery, there seems to be no way to a second income but by thrift, which means foregoing or at least deferring the enjoyment of whatever could otherwise be bought by the amount saved. Against this, we have the vigorous advertising of consumer goods and services and the full force of instalment purchase plans and credit cards. We have also a considerable amount of advertising offering to lend the home-owner on the value of his home in excess of his mortgage so that he can spend whatever he has already saved.

When I was quite new in the insurance business, we received a letter from a dear old lady who said that she had heard what wonderful things annuities were. Unfortunately, she had no funds with which to purchase one, but if we would loan her the money she would repay us out of part of the annuity payments. I am sure she would have liked this "second income plan."

Edwin L. Bartleson

* * * *

The Broken Promise

Sir:

On September 12, 1972 NBC presented a so-called documentary entitled "Pensions: The Broken Promise." This program was poorly researched, distorted conditions in the private pension field, and had a very large number of factual inaccuracies.

The implication was that failure and fraud are prevalent in the management of private pension funds.

Accuracy in Media Inc., a non-profit non-partisan organization, has filed a complaint with the Federal Communications Commission in connection with the factual misrepresentations presented in this program by NBC. Those of you that

would like to render financial or technical assistance with respect to this complaint should write Abraham Kalish, Executive Secretary, Accuracy in Media, Inc., 501-13th Street N.W., Washington, D.C. 20004. This is an opportunity for those of us consulting in the private pension field to counteract an important, biased public report on our specialty presented by a major network.

Richard H. Solomon

* * * *

After the Ball Was Over

Sir:

The following item (presumably from an unpublished part of the Apocrypha) was found on the floor of the examination room in Salt Lake City after the candidates had left. It may be of comfort to fellow sufferers and of help to the E. & E. Committee.

O. David Green III

Philosophizing

And it came to pass in the mornings of the first days of November there arose a multitude,⁽¹⁾ smiting their books and wailing, and there was much weeping and gnashing of teeth, for the day of judgement was at hand and they were sore afraid. For they had left undone those things which they ought to have done and there was no hope for them.

And there were many abiding in their rooms who had kept watch over their books all night, and, lo, it did nothing to avail them. But some there were who arose peacefully for they had prepared for themselves the way and made straight the path of knowledge. And these wise ones were known to some as the burners of the midnight oil, but by others they were called the curve spoilers.

And some of them repented of their riotous living and bemoaned their fate, but they had not a prayer. And at the last hour there came one among them known as the "King," he of the diabolical smile; he passed paper among them and went his way.

Many and varied were the answers which were given, for some of the learning had fallen among fertile minds, some had fallen in rocky places, while much had fallen flat. And some there were who wrote for three hours, others who wrote for five, but some turned away sorrowful. And many of these offered up a little bull in hopes of pacifying the Society, for these were the ones who had not a

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GLOSSARY

In order to be helpful to the accountants, we suggest that the following definitions be included in the next edition of the *AICPA Audit Guide*.

Contract: A kind of bridge.

Mortality Table: A slab in the morgue.

Mutual: When your car is out of gear.

Actuary: From the song, "I Actuary Confidentially, Ain't She Sweet?"

Limited Payment Life Insurance: When you run out of money before your premiums are paid up.

Benefit: A lodge picnic.

Joint Life: Cafe society.

Agent: A gentleman.

Life Expectance: Death and taxes.

Premium: The cut-glass fruit bowl Uncle Joe got for his cigarette coupons.

Premium Loan: What the pawn shop gave Uncle Joe for the fruit bowl.

Family Income Policy: Ma's administration of the budget.

Family Income Period: Payday to payday.

Lapse: What you get when you sit down.

Ordinary Life: Unglamorous existence.

Preferred Life: The other fellow's.

Juvenile Coverage: A diaper.

Disability Benefit: A raffle to buy someone a wooden leg.

Standard Provisions: Meat and potatoes.

Grace Period: Just before meals.

Courtesy of Equitable Life Assurance Society Agency News Items and the Palmisano Agency of the Equitable. □

THE RIGHT ANSWER

The question was, "Show how it is possible to determine the height of a tall building with the aid of a barometer." The student's answer was, "Take the barometer to the top of the building, attach a long rope to it, lower it to the street, and then bring it up, measuring the length of the rope. The length of the rope is the height of the building."

Now this is an interesting answer, but should the student get credit for it? Alexander Calandra of Washington University was asked by one of his colleagues to referee the grading of this student's examination question. It was pointed out that the student had a strong case for full credit because he had answered completely and correctly. On the other hand, if full credit were given, it could contri-

Editor's Note:

Mr. Boermeester is chairman of what is perhaps the least well known of the Society Committees, that on Standard Notation and Nomenclature. The following report is an example of the Committee's activity. Mr. Boermeester was Chairman of the Special Meeting to discuss Actuarial Notation which was part of the proceedings of the recent International Congress of Actuaries. Mr. Boermeester will serve as liaison with the Boehm Committee.

Few actuaries are aware of the origins of actuarial notation. The originator was one David Jones, whose volume on *The Value of Annuities and Reversionary Payments* probably is not as well known as it should be. From David Jones's locker came the basic idea of what is described as "halo" notation. (Is the actuary a little lower than the angels?)

One hundred years ago, in 1872, the Institute of Actuaries officially adopted the Jones notation. George King used it in his textbook and the International Congress of Actuaries finally approved the notation in 1901 (57 years after the publication of *The Value of Annuities and Reversionary Payments*). Slight changes \ddot{a} for a for example, were made in 1954, producing a somewhat more logical notation. Quiet reigned thereafter until the advent of computers. The computers could not digest the normal notation and since the computers are all-powerful (*pace* 2001!), the notation should be changed to fit the computers. A change was suggested in 1968 by Dr. Boehm and Dr. Reichel, who pointed out that the notation did not cover modern developments in actuarial science and was no use for communicating with computers. (The Cabots speak only to Lowells, but who speaks to the computers?)

Dr. Boehm and Dr. Reichel with ten co-authors presented a paper to the 18th International Congress of Actuaries in Munich, suggesting a new notation in linea form because the halo form was not sufficiently flexible. At the time of this Congress, a Committee (known as the twelve apostles—this must relate to the halo form) considered the question and voted to enlarge the Committee (to fifteen) which would be asked to report to the Oslo Congress. (A suggestion that, in the manner of the French Revolution, this Committee be called the Committee of Public Safety was turned down).

At Oslo there was a stimulating and even exciting meeting on the subject of the proposed new notation. Suffice it to say that there was no unanimity for the adoption of the proposed new notation and the opposition was by no means confined to the

bute to a high grade which would certify that the student knew some physics. Calandra suggested the student have another try at answering the question. He was quite surprised—the student agreed.

He gave the student six minutes, with the warning that the answer should show some knowledge of physics. At the end of five minutes, the student had not written anything. Dr. Calandra asked the student if he wished to give up, but he said no. He had many answers, and he was just thinking of the best one. In the next minute he dashed off this answer:

Take the barometer to the top of the building and lean over the edge of the roof. Drop the barometer timing its fall with a stopwatch. Then, using the formula $S = \frac{1}{2} et^2$, calculate the height of the building.

NOTES ON

by John M. Boermeester

At this point, it was decided that the student should be given almost full credit, but first he was asked some of the other answers that he could have given.

"There are many ways of finding the height of a tall building with the aid of a barometer," said the student. "For example, you can take the barometer out on a sunny day and measure its height, the length of its shadow, and the length of the shadow of the building; then by the use of simple proportion, you can determine the height of the building. Or, if you want a more sophisticated method, you can tie the barometer to the end of a string, swing it as a pendulum, and determine the value of g at the street level and at the top of the building. From the difference between the two values of g , the height of the building can, in principle, be calculated."

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NOTATION

members of the establishment. The result was that the Committee will be continued with broader representation, with instructions to report to the 1976 Congress in Tokyo.

In addition, President Ed Franckx of the International Actuarial Association has appointed Dr. J. Englefreit, Vice President of the I.A.A. for the Netherlands and Mr. E. A. Lew as a new official Subcommittee on Notation. This new Committee has the responsibility of working with the reformed group and gathering opinions on changes in notation.

There are gaps in the present notation—for example, there is no standardized notation for pension funds or for sickness insurance. It is only right that such gaps should be closed. In addition, it is highly desirable that the notation be compatible with standard statistical and demographic notation.

There have been proposals other than those submitted by Dr. Boehm's committee. Mr. David Jamieson's ACT (*The Actuary*, January, 1972), not a new notation but an adaptable programming language, must be considered. In 1971 the Institute of Actuaries of Australia and New Zealand issued a report on "A New Actuarial Notation" and in 1972 Mr. P. J. Turvey published a paper on "Some Provisions for a Revision of the International Actuarial Notation" in the *Journal of the Institute of Actuaries Students' Society*.

There are now four proposals for the Committee to consider, from Dr. Boehm, Mr. Turvey, the Institute of Actuaries of Australia and New Zealand, and Mr. Jamieson. For the benefit of the actuaries on the North American continent, here is one example of the suggested changes:

Present

Boehm

Turvey

$$\alpha \begin{matrix} (m) \\ x : \bar{n} \end{matrix}$$

$$a(x, n, k)$$

$$apnm(x, n, m)$$

ANZ

Jamieson ACT

$$b_2(x, n), \text{ etc.}$$

$$ANXNM \ X \ N \ M$$

The notation to be used, whether linear, halo, or some other, is a matter for all actuaries. Any members of the Society with any suggestions on notation should write to Mr. Lew or myself.

ARCH

The first number of *Arch* was reviewed in the May issue. Two issues of *Arch* have since been published and the list of contents thereof is given below. Puzzle fans will be glad to know that *Arch* now has a Problems (and Solutions) Section.

Issue 1972.2

- Comments on the First Number of ARCH*, Cecil J. Nesbitt
- Actuarial Criteria for Aging*, Richard G. Driskell, James C. Hickman
- Discounting for Risk*, Richard W. Ziock
- Some Thoughts on Generalized Distributions (and the Mathematicians who Produce Them)*, Hilary L. Seal
- Credibility for Loss Ratios*, Hans Buhlmann, Erwin Straub

Issue 1972.3

- Net Stop-Loss Premiums*, Melvin C. McFall
- Further Remarks on the Basic Mortality Functions*, J. J. McCutcheon, C. J. Nesbitt
- Actuarial Criteria for Regeneration*, Donald Brackey, James C. Hickman
- Smooth Polynomial Interpolation Formulas and Linear Transformations*, Brian Harvey, James C. Hickman
- The Solvency Problem in Risk Life Insurance*, Hans Ammeter

Subscriptions can still be sent to David G. Halmstad, Area 22 Z, Metropolitan Life, One Madison Avenue, New York, N. Y. 10010.

Right Answer

(Continued from page 4)

The student went on to say that if he were not limited to physics solutions, there were many other answers he could have given, such as saying to the superintendent of the building, "If you will tell me the height of this building, I will give you this barometer."

At that point Calandra asked him if he knew what the answer was that the professor expected to get. The student admitted that he knew the answer, but that he wanted to show his ability to think and solve a problem in a manner other than that routinely expected.

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Time Series

(Continued from page 1)

stock price movements. On Saturday morning, Donald Jones of the University of Michigan added yet another case study to the participants' load of papers with a study of hospital insurance claims through time.

Papers from the Waterloo Conference will be distributed through the Committee's distribution service ARCH, and those who are interested in obtaining copies of these papers should write to

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Area 22Z, Metropolitan Life
One Madison Avenue
New York, N. Y. 10010

for details. Regular ARCH subscribers will receive details on the distribution shortly.

In light of the extreme interest that was generated in Time Series Analysis by the Conference, the Committee on Research is planning to present several similar case studies at 1973 Society meetings.

ERRATUM

In the 1972 *List of Members by Business Connection*, the name of Mr. Paul V. Montgomery should be in the *Consulting Actuaries Section* under *Montgomery & Chamberlain* (page 50). Mr. Montgomery's name was inadvertently listed under Section XI.

Social Security Notes

The Railroad Retirement System: Its Coming Crisis, Report of the Commission on Railroad Retirement, June 30, 1972. (For sale by the Superintendent of Documents, Stock Number 5277-00001, \$2.50, pp. XVI + 570).

This Report might be of more than casual interest to actuaries since major parts of it deal primarily with problems of an actuarial nature. Besides, as many as 17 actuaries were associated with the Commission in one capacity or another. The prime significance of the Report is the recommendation for a restructuring of the railroad retirement system so as to make it a combination of social security proper and a supplementary pension plan. There is also an interesting statement by the group of actuarial advisors which, in some respects, transcends the area of railroad retirement proper.

NOTE: A detailed review of this Report (by A. M. Niessen) will be published in the *Transactions*. A summary is available on request at the address below.

* * * *

Selected Current Reference Data on the Railroad Retirement and Social Security (OASDI) Systems, Railroad Retirement Board, Actuarial Note No. 8-72, November 1972.

This four-page note is a very handy source of information on the operations of the OASDI and Railroad Retirement programs during fiscal year 1971-72. Included are benefit and beneficiary data, financial balance sheets, late actuarial cost estimates, and analytical ratios. Some examples of very interesting ratios are: (1) the number of beneficiaries on the rolls per 100 active contributors was 38 for OASDI but 170 for railroad retirement (December 1971), and (2) the benefits paid in calendar year 1971 constituted 8.8% of taxable payroll for OASDI but 40.7% for railroad retirement. The note also brings out the great dependence of the railroad retirement system upon the financial interchange with social security.

Free copies of this report may be obtained from the Office of the Chief Actuary, Railroad Retirement Board, Chicago, IL 60611. □

E. H. Wells

Mr. Wells is giving up his official Editorial participation in the work of *The Actuary* and it is with regret that we remove his name from the mast-head.

He has been an Associate Editor since May 1969, and his contributions to the Newsletter (identifiable in the form of book reviews, nameless in preparing and editing copy) have been most valuable.

In expressing our thanks for his services we also express the hope that he will still be heard from in our columns. *A.C.W.*

Letters

(Continued from page 3)

prayer and when they had finished, they gathered up their pencils,⁽²⁾ and went quietly away, each in his own direction and each one vowing to himself in this manner: "Perhaps in May I shall pass this way again. It is a long road that hath no turning."

- (1) A couple is two; a few is more than a couple, so a few is three. But many is more than a few, meaning four. However, a multitude is more than many, therefore a multitude is five or more.
- (2) Three or more No. 2 or No. 2½ (or HB or B) soft lead pencils with erasers.

* * * *

Personnel

Sir:

The hiring of actuarial students has traditionally, in our company, been centered in the Actuarial Department. The ones we turned down were likely to be hired by an actuarial department elsewhere.

We understand that recently there have been more candidates than available openings for new college graduates in the actuarial field. For that reason, we are adopting a new practice of sending the ones we cannot use to the Personnel Department, to see if any different department of the Company could take on the individual, not necessarily on the student basis. In this way, when an opening develops, we may have an unusually well-suited candidate for the job already in the company.

Other companies who have had the same practice as ours might consider our new procedure. An auxiliary benefit is that promotion of actuarial careers in colleges may soon suffer if more graduates cannot be placed in suitable jobs.

Ralph E. Edwards

Social Security Notes

F. Bayo and M. A. Lannen, *Mortality of Charter Beneficiaries*, Actuarial Note No. 78, August 1972, Social Security Administration, Washington, D. C. pp. 4.

This Actuarial Note analyzes the mortality experience of Charter Beneficiaries (workers who were entitled to monthly benefits for January 1940 and who continue to be so entitled) under the OASDI System. The Note compares the actual survivorship of Old-Age Charter Beneficiaries from December 1, 1964, to January 1, 1970, with estimates based on 1959-67 United States and Medicare experience. The analysis is given by sex. Such mortality analysis is particularly of interest, as the group of Chartered Beneficiaries studied provides a reasonably accurate age data at the higher ages (91 through 96).

* * * *

Actuarial Cost Estimates for the Old-Age, Survivors, Disability, and Hospital Insurance System as Modified by the Social Security Provisions of Public Law 92-336, Office of the Actuary, Social Security Administration, September 1972, pp. 24.

This special report deals with the amendments of July 1, 1972 which increase all OASDI benefits by 20 per cent and introduced automatic adjustments in benefits (for increases in the cost of living) and taxable wages (for increases in general wage levels). The same legislation also revised the tax rate schedules for both OASDI and Hospital Insurance.

Aside from presenting a variety of cost information, the report also discusses the criteria of actuarial soundness for OASDI and the changes in actuarial methodology which were necessitated by the newly enacted dynamic provisions and the recommendations of the last advisory council. There is also a brief discussion of the actuarial assumptions used and a chronology of past cost figures for the system.

Free copies may be obtained from the Office of the Actuary, Social Security Administration, Washington, D.C. 20201.

Actuarial Meetings

- Jan. 15, Chicago Actuarial Club
- Feb. 7, Nebraska Actuaries Club
- Feb. 20, Actuaries Club of Philadelphia
- Feb. 21, Actuaries' Club of Des Moines
- Feb. 26, Chicago Actuarial Club

Actuarial Exams

(Continued from page 1)

Part 2: Construction and Graduation of Mortality Tables (insurance and population tables).

Three further exams lead to Fellowship:

Part 3. Application of actuarial mathematics:

- (a) Selection of risks
- (b) Gross Premiums
- (c) Valuation of liabilities
- (d) Non-forfeiture Values

Part 4. Actuarial Management:

- (a) Expense analysis
- (b) Life insurance accounting
- (c) Investment of life insurance funds
- (d) Life Insurance law

Part 5: Actuarial principles in special lines of insurance:

- (a) Group life insurance
- (b) Accident and Health insurance (Individual and Group)
- (c) Pension plans
- (d) Social insurance

We have prepared a syllabus of readings, modeled largely after the *Society of Actuaries* readings, and we provide review sessions on four Saturdays prior to the exams.

At present we have a Committee for the Education and Examination functions combined, with a single over-all chairman, and a sub-committee for each part; each sub-committee has three members except for Part 1 which has six. (Part 1 is offered twice a year; the other parts once a year). Each sub-committee is responsible for revision of the syllabus, for conducting the review sessions, and for preparing and conducting the exams.

As a result of the exams given in 1970-1972, we have qualified eight new Associates, and several of these have passed one or two of the Fellowship exams. □

AH MEMORIES!

Note: The following poem will bring back happy (?) memories to the senior Fellows and elder statesmen.

Hall and Knight

OR

$$z+b+x = y+b+z$$

E. V. RIEU

When he was young his cousins used to say of Mr. Knight:
'This boy will write an Algebra—or looks as if he might'
And sure enough, when Mr. Knight had grown to be a man,
He purchased pen and paper and an inkpot, and began.

But he very soon discovered that he couldn't write at all,
And his heart was filled with yearnings for a certain Mr. Hall;
Till, after many years of doubt, he sent his friend a card:
'Have tried to write an Algebra, but find it very hard.'

Now Mr. Hall himself had tried to write a book for schools,
But suffered from a handicap: he didn't know the rules.
So when he heard from Mr. Knight and understood his gist,
He answered him by telegram: 'Delighted to assist.'

So Mr. Hall and Mr. Knight they took a house together,
And they worked away at algebra in any kind of weather,
Determined not to give it up until they had evolved
A problem so constructed that it never could be solved.

'How hard it is,' said Mr. Knight, 'to hide the fact from youth
That x and y are equal: it is such an obvious truth!'
'It is,' said Mr. Hall, 'but if we gave a b to each,
We'd put the problem well beyond our little victims' reach.'

'Or are you anxious, Mr. Knight, lest any boy should see
The utter superfluity of this repeated b ?'
'I scarcely fear it,' he replied, and scratched his grizzled head,
'But perhaps it *would* be safer if to b we added z .*'

'A brilliant stroke!' said Hall, and added z to either side:
Then looked at his accomplice with a flush of happy pride.
And Knight, he winked at Hall (a very pardonable lapse),
And they printed off the Algebra and sold it to the chaps.

*Pronounced "Zed"

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Salesman

(Continued from page 1)

Mr. Williams, discussing consumerism, pointed out the difference between the consumer and the often self-appointed consumerist. The consumerists reflect the more educated and questioning consumer who wants more service and has higher expectations than yesterday.

Mr. Williams' company has assigned an actuary full time to the agency department. The actuarial department provides assumptions and profit objectives, but the agency department determines the priorities. This has given outstanding

results in creation of new products, resulting in greatly increased premium income, but it takes a creative and persuasive actuary.

Mr. Waldo, giving the overview as president of a company, congratulated those assembled for having the finest union in the world. He felt the insurance market would not change drastically, and questioned certain past changes in marketing such as the family plan, and entry into property and casualty by many companies. He also decried recent actions by state insurance departments as being harmful to the insurance business by putting handicaps on good agents. □

Carl J. Singer, Chief Actuary, Veterans Administration, submitted this mortality experience of Servicemen's Group Life Insurance as being of interest to Companies writing military business. (Single copies of the Report are available from the Veterans Administration, Department of Veterans Benefits, Washington, D. C. 20420)

**Table 1 — Non-Viet Nam Experience for Calendar Years 1969 to 1971
Combined by Branch of Service and Age^a**

Branch of service	Age, years								
	All ages	17-19	20-24	25-29	30-34	35-39	40-44	45-49	50 & Over
Deaths, number									
All branches	13,080	1,682	6,054	1,493	1,031	1,206	781	458	375
Army	5,820	867	2,964	570	321	401	321	176	200
Navy	2,804	302	1,295	433	276	224	147	74	53
Air Force	3,055	173	1,070	373	359	522	271	181	106
Marine Corps	1,245	325	653	98	59	54	34	17	5
Coast Guard	131	15	71	12	14	5	4	7	3
Public Health ^b	25	0	1	7	2	0	4	3	8
Annual death rate per 1,000 total									
All branches	1.59	1.60	1.49	1.38	1.43	1.72	2.28	3.11	4.50
Army	1.87	1.72	1.75	1.55	1.89	2.38	2.42	3.42	5.51
Navy	1.40	1.63	1.23	1.44	1.32	1.53	2.23	2.23	4.07
Air Force	1.33	1.00	1.14	1.08	1.24	1.53	2.17	3.31	3.58
Marine Corps	1.91	1.83	1.96	1.89	1.64	1.70	2.53	3.14	2.47
Coast Guard	1.16	1.16	1.30	.86	1.20	.50	.89	4.11	2.24
Public Health ^b	1.38	.00	.30	1.19	.64	.00	2.76	2.85	7.73
Annual death rate per 1,000, accidental^c									
All branches	1.18	1.30	1.30	1.19	1.05	.88	.75	.67	.61
Army	1.36	1.38	1.49	1.24	1.32	1.06	.78	.66	.77
Navy	1.12	1.35	1.12	1.32	1.07	.89	.76	.51	.51
Air Force .....	.93	.89	1.03	.97	.88	.80	.78	.82	.47
Marine Corps	1.52	1.40	1.72	1.72	1.25	1.01	.45	.00	.49
Coast Guard .....	.91	1.08	1.23	.64	.71	.20	.00	.00	.75
Public Health ^b .....	.72	.00	.30	1.02	.32	.00	1.38	1.90	.97

^a Excludes all Viet Nam and 4 months post-separation exposure and deaths.

^b Includes National Oceanic and Atmospheric Administration.

^c Includes all accidents, whether on or off duty.

Table 2 — Viet Nam Experience for Calendar Years 1969 to 1971 Separately, All Ages^a

Branch of service	Number of Deaths				Annual rate, per 1,000			
	Three Years	1969	1970	1971	Three Years	1969	1970	1971
All branches.....	20,029	11,653	5,999	2,377	16.6	21.9	14.3	9.3
Army	15,255	8,207	4,913	2,135	18.0	23.2	16.3	11.1
Navy ^b	725	450	209	66	7.7	10.0	6.9	3.7
Air Force	582	292	192	98	4.0	4.9	3.8	2.7
Marine Corps	3,467	2,704	685	78	28.4	36.1	17.7	9.4

^a Death claims in this experience are based on actual claims received by the SGLI primary insurer.

^b Includes Coast Guard. The exposure for the Navy has been adjusted to make it correspond as closely as possible with the allocation of deaths to the Viet Nam area.

Table 3 — Four Months Post-Separation Experience for Calendar Years 1969 to 1971, All Ages Combined^a

Branch of Service	Number of Deaths				Annual rate, per 1,000			
	Three Years	1969	1970	1971	Three Years	1969	1970	1971
All branches	2,778	908	986	884	2.84	2.92	2.93	2.68

^a The SGLI policy provides for a continuation of the active duty coverage for 120 days after separation from service without premium payment.

^b The 4 month post-separation experienced for all ages combined is almost double that of non-combat active duty because of the inclusion of many physically impaired lives, mostly service-disabled lives.