



The Actuary

The Newsletter of the Society of Actuaries

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OCTOBER, 1978

NEW TEXT BOOK

A group of five authors has now been selected to write the new text book on actuarial mathematics. The book will probably be in two volumes, and will expand upon the material covered in Jordan's *Life Contingencies*. It will include applications of contingency theory to individual and group life and health insurance, annuities, pension funding, and computer algorithms used in calculating actuarial values. It will also cover some elementary applications to casualty coverage and to risk theory.

The authors selected to write the new text book are:

Newton L. Bowers, Jr., F.S.A., M.A.-A.A., Professor of Actuarial Science, College of Business Administration, Drake University;

Hans U. Gerber, A.S.A., Associate Professor of Mathematics, University of Michigan;

James C. Hickman, F.S.A., A.C.A.S., M.A.A.A., E.A., Professor of Business and Statistics, University of Wisconsin, Madison;

Donald A. Jones, A.S.A., M.A.A.A., E.A., Associate Professor of Mathematics, University of Michigan;

Cecil J. Nesbitt, F.S.A., M.A.A.A., A.I.A., Professor of Mathematics, University of Michigan.

The text book development will be reviewed by a committee consisting of representatives from the Casualty Actuarial Society and the Society of Actuaries who specialize in the fields of life, health and group insurance, pensions, casualty insurance, and actuarial education. This book is being designed for the course of reading in the Associateship examinations, and it is expected will be published by 1981.



21st INTERNATIONAL CONGRESS OF ACTUARIES

Announcement No. 2 of the Congress Committee has been distributed to members of the International Actuarial Association for 1977 and/or 1978. Note that the Provisional Registration form enclosed therein must be forwarded to the Congress Correspondent by October 31, 1978.

Members of the Canadian Section should send the original and first carbon copy to:

MR. LAURENCE E. COWARD
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7 King Street East
Toronto, Ontario M5C 1A2, Canada

Members of the U.S. section should send them to:

MR. JOHN C. WOODY
Senior Vice President
North American Reassurance
Company
245 Park Avenue
New York, New York 10017

Actuarial Meetings

Nov. 6-8, Conference of Actuaries in Public Practice

Nov. 9, Baltimore Actuaries Club

Nov. 13-14, Canadian Institute of Actuaries

Nov. 15, Seattle Actuarial Club

Nov. 16, Southeastern Actuaries Club

Nov. 21, Chicago Actuarial Club

MORTALITY MENSURATION

Robert W. Batten, *Mortality Table Construction*, pp. 246. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632, \$15.95.

by Richard L. London

Measurement of Mortality by the late Harry Gershenson has been for the past seventeen years perhaps the only text published in North America on the subject of the construction of mortality and other tables. It certainly has been the best known and most widely read. It has now been joined by a new publication, *Mortality Table Construction* by Robert W. Batten, Professor of Actuarial Science at Georgia State University.

The scope of the topic contained in the new text is virtually the same as that of the older text, although presented in a slightly different order. In seven successive chapters, Professor Batten discusses the several common mortality assumptions [uniform distribution of deaths (UDD), Balducci, constant force]; the concept of exposure and how it can be directly determined under the Balducci hypothesis; methods of tabulating the basic categories involved in mortality studies; individual record exposure studies (using actual ages, insuring ages, policy durations, and fiscal ages); valuation schedule exposure studies, categorized as being Balducci based or UDD based; the demonstration (both intuitively and mathematically) of the equivalence of an individual record formula and a valuation schedule formula based on identical assumptions (counterpart formulas); and, finally, practical aspects of mortality studies.

Overall, this reviewer considers the new text to be a fairly good one.

Specifically, the treatment of tabulating rules, independent of an application to actual, insuring or fiscal ages, is well

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 articles, criticisms, and discussions in this publication.

EDITORIAL

IT is a rare occasion, if it ever occurs, when the insurance press does not contain at least one item of particular interest to the reader—there is usually no lack of items of general interest.

In recent issues *The National Underwriter* has been running a series of articles on Risk Selection and the problems that have arisen from the recent legal or regulatory imposed barriers to the equitable exercise of the selection process. These articles are encouraging reading for those members of the insurance industry who have, until now, been not too successful in arousing the industry to take up arms against the sea of troubles that threatens to engulf us. The problem is not confined to the life insurers, the property and casualty companies are equally involved.

It would be desirable, if possible, for the insurance industry to spread the gospel of equity over a wider area than that covered by the insurance press. There is no progress in preaching to the converted. In the articles several individuals were quoted as urging the industry to tell its story to the public even through the medium of an underwriters' lobby.

It is a favorable sign that we have actuarial and industry committees working on the problem, but we still need to inform and convince the legislators, the regulators, and the public. On our side we have to be sure that our underwriting practices and procedures can be explained and defended to the public we serve.

We should not overlook the part which the courts play in this situation. *The National Underwriter* reported Ms. Gloria M. Jimenez's (Ms. Jimenez is the Federal Insurance Administrator) address to the recent annual meeting of the American Risk and Insurance Association under the heading *Judiciary The Key to Setting Public Policy*. The report suggested to one reader at least that the Judiciary was coming dangerously close to making the laws and not confining its actions to interpretation. And some of the recent court decisions suggest (to the same reader) that there is a need to explain to the bench what insurance is and how it works.

A.C.W.

LETTERS

The Manhart Case

Sir:

The Board in authorizing the brief believed that facts and information on the consequences of a decision were being submitted. It was careful not to authorize comments on the decision itself. This is surely a reasonable and useful attitude for the Board to take. All would have been well if the case had not been of the kind to cause some members to feel that there were opinions in the information, and to disagree with these opinions.

For future cases it would be proper for the Board to try to determine if differences in view are held and if so, to authorize a statement by the second procedure in Article X, that is, in the name of the committee or task force. It would be unfortunate if this one case led to future Boards feeling inhibitions which prevented the quick release of information when this is judged to be needed in the public interest.

John C. Maynard

* * * *

Sir:

I understand that the Board of the Society of Actuaries has reviewed its actions in the Manhart case and has concluded that it did not exceed the authority granted by Article X of the Constitution.

This conclusion appears to be based on the following line (circle?) of reasoning:

(1) The Board intended to express facts rather than opinions.

(2) The Board believes that it did what it intended to do.

(3) Therefore, the Manhart brief was a statement of facts.

Newspeak has arrived six years early.

Robin G. Holloway

* * * *

Sir:

In view of all the hubbub on the Manhart Case brief, I wonder how comfortable the authors of the brief would have been had the brief been submitted prior to 1970, when the rules prohibited expressions of opinions. If the comfort level would have been low, it seems to me that Article X provides no additional comfort.

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Letters

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On the other hand, if the issue is so important, why isn't an opinion offered by the Society? In other words, under what circumstances would it be appropriate for the Society to issue an opinion? Article X provides little guidance in this respect other than to exclude matters not within the special professional competence of actuaries.

Frank Rubino

* * * *

The Privacy Act

Sir:

I should like to draw the attention of your readers to the "Report of the Ad Hoc Committee on Privacy and Confidentiality" published last year by the American Statistical Association. (*The American Statistician*, Vol. 31, No. 2, May 1977, p. 59.) While the operations of this committee were mainly concerned with the statistical operations of various statistical and administrative agencies of the Federal Government, the report would repay reading by any actuaries with an interest in privacy and confidentiality and the quality of government statistics.

The report analyzes the effects of the Privacy Act, the Freedom of Information Act, and the Federal Reports Act on the responses to questionnaires, information transfers between agencies and the release of data on request. While the quality of response has not been noticeably affected, the cost to achieve the same degree of response has increased over that of prior years. The Committee was particularly concerned about providing effective protection to information collected under a pledge of confidentiality.

Robert J. Johansen

* * * *

Reorganization of the Actuarial Profession

Sir:

I was very much interested in reading various proposals for the re-organization of the actuarial profession as published in several issues of *The Actuary*.

In this connection I would like to propose that there be one and only one Actuarial Institution in the U.S.A., not because there is one and only one A.B.A.,

one and only one A.M.A., one and only one A.I.C.P.A., but because there is one and only one subject of Actuarial Science. A single actuarial body will admirably suit the requirements of the public and various governmental bodies.

I would like to submit that the degree of Fellowship of this Actuarial Institution be granted by successful completion of eight parts of examinations plus two years practical experience in the field of the speciality chosen by the candidate. The required practical experience can be acquired concurrently while writing papers for the Fellowship examinations or after the completion of all the eight examinations depending upon the convenience of the candidate. Only Fellows will be allowed to call themselves "Actuaries" and will be free to practice in their respective specialities. Thus, the present need for "special" actuaries (e.g., enrolled actuaries) would be eliminated. It is also not inconceivable that all English speaking countries may adopt a common Associateship examination.

The Associateship examinations, to be taken by all candidates, would involve the basics of actuarial science and would consist of the following subjects, covered by five parts.

Part 1. Numerical Analysis covering General Mathematics; Calculus of Finite Differences; Use of Computers for the solution of simple actuarial problems.

Part 2. Probability and Statistics covering mathematical Theory of Probability and Statistics with special emphasis on actuarial applications.

Part 3. Finance covering Economics; Theory of Money and Banking; Elementary Theory of Investment of Funds; Theory of Compound Interest.

Part 4. Theory of Risk, Theory of Life and Other Contingencies.

Part 5. Compilation and Graduation of Actuarial and Allied Tables.

After the completion of the Associateship examinations, the candidate would proceed to the three Fellowship examinations (Parts 6 through 8) in the speciality chosen by him. These specialities could be as follows:

(1) Life, Accident and Health;

(2) Employee Benefit Plans including Social Insurances (Social Security, Unemployment Insurance, Worker's Compensation, Welfare Programs etc.);

(3) Casualty Business (Fire, Theft, Burglary, Auto, Liability, etc).

The Education and Examination Committees can decide the details of the subjects to be included in each speciality.

The members of existing actuarial bodies would have the benefit of a "grandfather clause" and would be granted appropriate grade of membership in the new Actuarial Institution.

G. B. Saksena

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Actuaries as Lobbyists

Sir:

I read with interest the comments of Milton J. Goldberg contained in his letter in last month's *Actuary*. The letter dealt with Mr. Goldberg's thoughts on actuaries as lobbyists.

Actuaries have long been stereotyped. It has been said that they lack the ability to transmit verbally and with enough "salesmanship" those ideas which study and experience have taught them may be useful in dealing with contemporary business and economic problems. As contained in *The Wall Street Journal* passage quoted in the September *Actuary*, "If . . . the system is to avert ultimate catastrophe, more people in Washington are going to have to submit to actuarial discipline." This couldn't be more true. One challenge in being an actuary is learning to apply what talents we possess to those areas of business, government, and labour which so badly need them while, at the same time, ". . . substituting facts for impressions."

It is time for those actuaries who feel compelled to put their expertise to work in more public forums than usually associated with the profession, to do so. In doing so, however, we must be certain that we bring to these areas those high standards of integrity and excellence generally inherent in the profession (forget Equity Funding).

So let's encourage actuaries to get involved rather than letting ". . . attorneys . . . be the lobbyists . . ." Actuaries have done that for too long.

John A. MacBain

* * * *

(Continued on page 7)

TO BE CONTINUED

Editor's Note: This article is submitted by the Committee on Research. Comments will be welcomed by the Committee and by the Editor.

Actuarial Research at North American Universities

by Hendrik J. Boom

1. INTRODUCTION

When the Society of Actuaries Committee on Research was asked last summer to investigate and write a short report for *The Actuary* on the current situation in actuarial research at the Universities, a short one-page questionnaire was developed and circulated to a limited sample of North American Universities with actuarial programs.

This questionnaire asked whether the University addressed was conducting any research in actuarial science, who was involved in such research, in what direction further research was to be encouraged and, finally, further comments and suggestions were invited.

The response was unexpectedly high—over 75% of the questionnaires were answered, often quite elaborately.

Table 1 below lists the responding Universities, alphabetically ordered by a two letter code (in the remainder of this article the responses are referred to by means of this code.) For the benefit of any readers who might wish to obtain more detailed information, for each university the name of the respondent is also shown.

Table 1 Responses to Questionnaire

BC	University of British Columbia	Phelim Boyle
BS	Ball State University	John Beekman
DU	Drake University	Newton Bowers
JM		John Mereu
MA	University of Michigan, Ann Arbor	Cecil Nesbitt
MR	Mathematical Research Centre, Madison	Tom Greville
NE	North Eastern University	Geoffrey Crofts
NL	University of Nebraska, Lincoln	Cecil Bykerk
PS	Pennsylvania State University	Arnold Shapiro
UI	University of Iowa	Stuart Klugman
UL	Université Laval	Jacques Faille
UM	University of Manitoba	Amir Bukhari
UW	University of Waterloo	Frank Reynolds
WM	University of Wisconsin, Madison	Jim Hickman

In Section 2 an overview of subjects of current research is given, each subject being followed by the code for the school (or schools) engaged in that particular area.

Judging from the many suggestions and strong representations for financial and other support expressed in the responses received, one must conclude that this is an area of great concern for almost all responding academics. Section 3 reports on proposals for encouraging the appropriate bodies to provide such assistance.

2. SUBJECTS OF ACTUARIAL RESEARCH

There is a large number of researchers working on risk theory topics and a smaller but still significant number working on graduation, analysis of time series, and similar topics. Really surprising was the large number doing research in the pension area. This would appear to indicate the importance of research in a very active and practical field; one which is rapidly changing and in which, to the detriment of all concerned, non-actuarial views may prevail unless our profession steps in.

An overview of the responses follows:

(i) Pension Topics

Design:

- General (UW)
- Indexing, inflation (UM)

Legislation:

- Impact of current legislation on costs (UM)

Funding and Valuation:

- General (UW)
- Portability of Pensions (UL)
- Dynamic and Stochastic models (MA,WM)
- Valuation of Pension Plan Liabilities (UL)

Social Security:

- Mathematical models (MA)
- Social Security, wealth and private savings in Canada (BC)

(ii) Risk Theory and Related Topics

- General (MA, UI, UW)
- Practical applications (BS)
- The problem of claim fluctuation reserves (UM)
- Stop-loss reinsurance pools (MA)
- Gamma-distributions and risk theory (MA)
- Catastrophe insurance (WM)
- Credibility theory (WM)
- Risk classification (UW)
- Economic Theory of Risk (UL)

(iii) Graduation

- Theory of graduation (MA)
- Bayesian methods (WM)
- A linear programming approach (WM)
- Adjusted Moving Averages:
 - The L_1 norm (WM)
 - Extension to end-values (MR)
- Smoothest A.M.A. formulas (MR)
- Graduation Problems in Mathematical Demography (UL)

(Continued on page 5)

To Be Continued*(Continued from page 4)***(iv) Mortality**

Bayesian methods and mortality projections (WM)

Cancer mortality models (BS)

Cystic fibrosis—continuing study (MA)

(v) Probability and Statistics

Stochastic processes with applications to finance (BC)

Applications of novel statistical methods to problems of graduation, mortality estimation, and credibility (UI)

Time series analysis (BS)

(vi) Finance, Investing

Policy loan rate determination (NL)

A riskless strategy for equity-linked contracts (BC)

(vii) Industry Regulation, Legislation

Regulations of insurer solidity through capital and surplus requirements for the underwriting of non-life insurers (PS):

(a) new enterprises

(b) going concern analysis

(viii) Miscellaneous Topics

Accounting:

Extension of general accounting theory to life insurance and pension plans (DU)

Computers:

Development of in-line system for computation of functions arising in insurance and pension work (UM)

Application of micro computers to various insurer operations (UM)

Rate Making (MA)

Disability Income (UW)

Cost comparisons (WM, UW)

Cost analysis (UW)

Taxation (UW)

Most of the above subjects were mentioned as areas in which more research should be undertaken, but other directions for further research were also advocated:

- Pension funding appeared to be in the forefront of subjects requiring further research: suggestions were received for work in all of the pension areas, particularly funding (UM), for dynamic and stochastic approaches to pension funding (BC, MA, PS), and social security (MA), and for work on pension funding under conditions of wage inflation, benefit adjustment, and fluctuating work forces (WM).
- Strong support for further development in risk theory, particularly its practical applications (NE), and credibility theory (BS) was noted, as well as various subjects in statistics, e.g. time series analysis (BS).
- Application of statistical methods (mathematical statistics) to insurance and pensions (UL).
- The most specific proposal for further investigation was the one for development of statistical criteria for values of the constant "k" arising in graduation by means of a Whittaker-Henderson difference equation (MR).
- Developments in mortality theories (NE) and use of Bayesian methods (WM) and demographic projection matrices (MA) for mortality projections were also recommended for investigation.
- In the investment and finance area a suggestion was made for the application of advances in the theory of financial economics to actuarial problems (BC).

A number of miscellaneous subjects in which further research is to be encouraged were brought forward. These included:

- review of relevant plans of disability income insurance in different jurisdictions (UW).
- disability income: discrimination against women (UW).
- cost comparisons between dissimilar policies (UM).
- quality of surplus of risk funds (NE).
- determination of amounts of surplus required to adequately support the group business (JM).
- determining an appropriate level of contingency charges (JM).
- corporate planning (NE).
- areas related to current or pending legislation or to industry needs (PS).
- investigation of new opportunities opened up by recent rapid advances in electronics and computer technology (UM).
- liability insurance for nuclear power plants (WM).
- catastrophe reinsurance pools (WM).

There appears to be no shortage of topics that need working on and, for many of these, non-academic actuaries could see a very practical value in research being undertaken at the universities.

3. ENCOURAGEMENT OF AND FINANCIAL ASSISTANCE FOR ACTUARIAL RESEARCH

From the responses received it appeared that most suggestions for improvement in this area were addressed to what can be done by the academic community itself, by the professional organizations (Society of Actuaries, Canadian Institute of Actuaries) and by the insurance industry. We shall consider these three categories in the order named.

Many researchers felt that they would benefit from more contact and exchange of ideas with their fellows; means for this already existed, such as in workshops at Society and Institute meetings, the Research Conferences organized by the Society's Committee on Research and publication in ARCH, but there was room for improvement. Conversely, research at the universities was considered to be impeded by the attitude of some professional journals: "... the requirement that a paper be of interest to a substantial number of actuaries almost guarantees insularity" (WM).

To Be Continued*(Continued from page 5)*

Interdisciplinary work with economists, demographers, financial analysts, and lawyers should be encouraged (UL).

Some suggested that the Society should commission re-write work on the more mathematical and theoretical study notes (DU) and on some of the textbooks now on the syllabus, and should encourage the creation of new texts to reflect changes in the educational requirements of actuaries (DU, UM).

Others felt that the actuarial bodies should consider giving direct financial assistance to support research (WM), either by awarding prizes, e.g. an annual prize for the best paper(s) produced by their members (BC), or by, for instance, supporting the full time research of some professors each summer (BS, DU, UW). Liaison between the Society's Director of Education and academics could result in "mini-sabbaticals" (DU); ". . . the basic problem . . . is identification of research areas and coordination with those who will use the results" (UI).

It was noted that the CIA Mortality and Morbidity studies could, at virtually no additional cost, be carried by the universities, thus increasing the professors' internal prestige as a welcome byproduct (UW).

It was also proposed that the Society should keep a well-publicized and periodically updated list of available theoreticians so that, when a company needed a solution to a particular problem, it could consult this list and finance an academic to do the research rather than, as is so often done, setting up a committee to do this. As for costs, "for the industry this (would be) little more than the cost of a single committee meeting" (UW). Cooperation between university researchers and the industry should be strengthened (UL).

With respect to industry attitudes, most responses could be considered to fall in two categories. First, there was some strong feeling that pressure on young actuaries to pass exams prevented them from undertaking research projects and created a tendency to see instruction aimed at exam passing as the only function of university actuarial programs (NE), WM). Direct recognition of the Master's degree in salary determination would help (UI).

Secondly, strong representations were made urging the insurance industry to "contract out" research to the universities: ". . . the university . . . is an environment for the pursuit of research which the industry needs accomplished but (which) . . . is either not being done or is being done by individual companies instead of on an industry-wide basis. The funding of such research could come from the industry, thus benefitting . . . the universities as well as the industry" (NL).

One response (UW) listed a number of projects for which assistance had been requested from both government and industry, but which had all been refused (one was refused by an industry committee on the grounds that "it was felt that actuaries were not qualified to do research into life insurance of a broad nature!"); in addition, great difficulties were encountered in obtaining information from industry sources.

More understanding from the industry would be a great help—" . . . there appears to be little recognition of the fact that an industry brief carries less weight with legislators and regulators than a brief by independent University professors" (UW).

One respondent mentioned that a project for simulation of a life company operation was "farmed out" to an outside agency before it had been offered to one of the universities' actuarial departments (PS).

The comments regarding suggestions to the academic community and professional organizations could have been more or less expected, although this does not make them any less important; the suggestions to the industry however are most revealing and should be given very serious consideration by companies and consulting firms. With some very minor changes in the way they do things there could be a major impetus to research in the universities that could benefit the whole profession (and the industry!). □

Mortality Mensuration*(Continued from page 1)*

done. Professor Batten utilizes a "generalized calendar age" tabulating rule which prepares the reader for dealing later with fiscal age tabulations, a task which has traditionally been a difficult one.

Another useful feature of the text is a significant emphasis placed on the algebraic proof of the equivalence of counterpart formulas. In the older text, Mr. Gershenson apparently assumes that such equivalence is intuitively seen, and that an algebraic demonstration thereof is not necessary. Although Gershenson's assumption is quite reasonable, an algebraic proof, if not over-emphasized at the expense of general reasoning, can also be instructive.

Candor requires, however, that several criticisms of the text be mentioned.

There is undue emphasis on mathematical foundations and analysis of various mortality assumptions in Chapter 1. This material fundamentally belongs to the subject of life contingencies, and is adequately treated by Jordan. A brief review of this material would have been appropriate by Professor Batten, but the emphasis which he has placed on it may cause readers to overestimate the importance of solving algebraic manipulations at the expense of the basic purpose of the text, an understanding of the theory and practice of experience investigations and table construction.

The set of individual record exposure formulas in upper case notation, referred to by Gershenson as "against the traffic" formulas, is developed totally algebraically by Batten, with no supportive general reasoning or intuitive explanation. The same can be said of his development of continuous formulas from their associated single interval forms. Pedagogic considerations would seem to require that a text point out the logic and rationale of formulas, in addition to their algebraic correctness.

In Chapter 5, Batten develops valuation schedule formulas based upon the uniform distribution of deaths assumption. Such formulas are certainly viable alternatives to the traditional Balducci-based set; in fact, one of the UDD-based is probably the most widely used of all

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Mortality Mensuration

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valuation schedule formulas. However, the attention given to these UDD-based formulas seems to be excessive and ill-advised.

The Balducci basis, although chosen for practical, not theoretical, reasons, has the useful property of allowing an independent determination of exposure which can then be divided into the deaths to determine rates of mortality. UDD-based formulas have no such property. Thus they do not have a comparable intuitive base, and really just exist as the result of an algebraic manipulation. Since there is no independent determination of exposure, it follows that UDD-based valuation schedule formulas do not have individual record counterparts. It should also be pointed out that under the assumption that migration occurs at the ends of unit intervals, the single-diagonal Balducci-based formulas are in fact exact formulas, whereas the analogous UDD-based formulas are correct only under the UDD assumption.

On the matter of the algebraic demonstration of the equivalence of counterpart formulas, Professor Batten warns the reader that confusion can arise from the fact that valuation schedule formulas have rigidly-defined notation, whereas the individual record counterpart formulas do not. Unfortunately, the text tends to contribute to this confusion by occasionally changing the definition of the previously well-defined valuation schedule symbols to conform to the arbitrarily-defined individual record symbols. Much less confusion would ensue if the text were to consistently allow the former to remain well-defined, while defining the latter to conform in each case.

Since there is practically no difference in the scope of coverage of the Batten and Gershenson books, it would appear that the two should be compared on the basis of pedagogic effectiveness. In the preface for the Society of Actuaries in the new text, attention is drawn to the fact that many students study this subject on their own, unaided by classroom instruction. In light of this, it is important that text material be designed to effectively communicate to readers material and concepts that can be fairly complex. The ability to achieve this effective

communication in textbook form is a rare skill.

With all due respect for Professor Batten's pedagogic abilities as a writer and classroom instructor, it is the opinion of this reviewer that the text by Mr. Gershenson is the better one. The toll road analogy praised by Batten in his preface, but not utilized by him in the text, is an exceedingly useful teaching device. Furthermore, Mr. Gershenson had that rare ability to communicate with his readers almost conversationally. Although not incapable of improvement, Gershenson's work, judged on the basis of pedagogic effectiveness, can only be described as excellent.

The Batten text has been chosen by the Education and Examination Committee as the officially recommended text for the Part 5 examination. Nevertheless, it would be advisable for the Society of Actuaries, as the publisher of the Gershenson text, to continue to make it available as a companion resource to the Batten text. □

Letters

(Continued from page 3)

Actuarial Directions

Sir:

In the September issue, Mr. Leckie asks for ideas for future Actuarial Research and Experience Studies. I would like to propose two such ideas.

First, I think there is a need for an entire review of the subject of risk classification criteria. In the past, the tests of a useful criterion included at least the following:

- (1) It should be easily understood (such as sex, age, etc.)
- (2) It should be easily quantified (such as age, height, etc.)
- (3) It should provide a meaningful differentiation (for example a difference in attained age usually means a difference in remaining lifetime).

However, no one criterion is an absolute predictor of remaining lifetime. Therefore, the anti-discrimination forces have successfully attacked most criteria. It is no longer legal to require mandatory retirement at age 65. It is no longer legal to differentiate pension contributions as between men and women. And so the process continues.

What is needed is some alternative set of criteria which meet the three tests listed above, but which have not yet been encrusted with the emotional discriminatory connotations of sex, age, etc. Such a new set of criteria would permit the life insurance industry to continue to match the premium to the risk.

Second, I think there is a need for authoritative statistics in areas where new corporate and governmental activity is beginning, and where the insurance industry has not been very active. In the past, movement into these areas has led to over-generous benefits and under-funding. The funding weaknesses of Medicare, Social Security Disability, state pension plans, and similar situations are not all traceable entirely to a lack of statistics at the outset, but that lack was certainly a factor.

Now, for example, we see a need to provide group life insurance, disability benefits, health benefits, and pension accruals between 65 and 70. Important regulatory and corporate decisions are being made on inadequate statistical evidence. The Society could do a service to government, the corporate world, and the insurance industry by putting forward in a simple format what information is available, and by organizing to collect further information as the years go by. The format should be simple and not unduly burdened with footnotes and disclaimers.

George L. Hogeman

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MAIL

There's been a change in the mailing address for material to go into *The Actuary*. Please be sure to address it—

THE ACTUARY
Mail Drop 20-7
1740 Broadway
New York, New York 10019

Deaths

Blackburn H. Hazlehurst
James H. Riggs

BOOK REVIEW

Robert M. Ball, *Social Security—Today and Tomorrow*, New York: Columbia University Press, 1978, pp. 528. \$14.95.

by Robert J. Myers

Robert M. Ball (Commissioner of Social Security until 1973) writes on his philosophical views on Social Security. The book is entirely in the form of questions and answers about the present program and possible changes thereof, and does not give insights as to the inner workings of the government while the program was being developed.

The 16 chapters seek to explain what Social Security is, the new law, the financing, the benefits, the types of employment covered, the benefit amounts, the retirement test, and several subsidiary topics. These latter include whether Social Security is insurance; whether women and minority groups are treated fairly; whether Social Security is welfare; and its inter-relationship with private pensions. The final chapter gives 31 propositions of the author as to how the program should be considered and how it should be changed.

Those who have a rather thorough knowledge of Social Security will find the discussion far too wordy. They can, however, get a good idea of the author's views by reading only the recommendations at the end of each chapter, and especially the last chapter.

On the benefits side, Mr. Ball has many proposals to liberalize the program, although in a few instances he proposes some restrictions. Perhaps his major recommendation in the benefit area is an increase of 12½% in the primary benefits, accompanied by a reduction in spouse's benefits from 50% to 33⅓% of the PIA. The benefit for a couple thus remains at the same rate as at present. An interesting, although minor, proposal is to increase benefits by 10% upon attainment of age 85. The rationale is that the very oldest people develop additional needs for care.

As to the maximum taxable and creditable earnings base, Mr. Ball is somewhat ambivalent in his views. In some places, he expresses the view that the presently-scheduled employee bases are quite proper and produce reasonable benefits for higher-paid workers, although elsewhere the belief is stated that the 1977 Act went somewhat too far in

this direction. He is quite clear in his strong belief that such base should be eliminated for the employer tax.

Mr. Ball recommends a number of other liberalizations, the most important being as follows:

(1) A one-year readjustment benefit for widows not otherwise eligible for benefits.

(2) An increase in the maximum lump-sum death payment from \$255 to \$1,000.

(3) An increase in the exempt amounts in the earnings test for those under age 65 to the amounts for persons aged 65 and over.

(4) Computation of the AIME ultimately over 30 years, rather than 35.

(5) A reduction in the waiting period for disability benefits from 5 full months to 3 months (in one place, 2 months).

(6) Liberalization of definition of disability at age 55 to an occupational one.

(7) Payment of full-rate benefits to disabled widows and widowers, and also benefits for disabled spouses.

(8) A catastrophic cap for HI and SMI.

(9) HI and SMI combined into one program, and the enrollee SMI premiums eliminated, with financing solely from payroll taxes and a government subsidy.

The OASDI changes would involve considerable cost — about 3% of payroll on an average long-range basis. Mr. Ball's solution is quite simply to introduce a government subsidy that would be gradually phased in and would eventually result in tri-partite financing. His views seem to be based on the naive assumption that the "Government is a separate entity unto itself and has its own money."

As to private pension plans, Mr. Ball expresses strong support for them, but his proposals would certainly lead to their decline in importance in providing economic security for the nation.

In a few instances, Mr. Ball proposes reductions in benefits. He suggests that the present restriction on dual benefits when Workers' Compensation is involved should be extended to other programs involving payment of benefits for disability. He also believes that 50% of OASDI benefits should be subject to income tax.

It is rather surprising in view of the author's long-time experience that the book contains a number of significant factual errors. For example, it is stated that, from 1968 through 1977, the level of OASDI benefits rose by 130%, and prices rose by 75%, so that the real value of benefits increased by 55%. The correct method of obtaining the real increase is, of course, not by subtracting the percentages, but rather by dividing 230 by 175, yielding the correct increase of 31%. Moreover, the method of obtaining the two increases is inconsistent, because the benefit increase includes the one for February 1968. If proper comparison is made, the changes should be measured from February 1968 (after the increase) to June 1978 (after the increase that month). Then, the benefit increase was 105%, as against the CPI rise of 77%, or a real increase of 16%. It should be noted, moreover, that about 10 points of this increase were "recovered" by the 1977 Act.

The Social Security system is scheduled for both a general and a particular analysis in the very near future. Mr. Ball's book can be helpful in this consideration but it is important to remember that the book represents but one opinion. There will be many others.

Note: A more detailed review will appear in the Transactions. □

Social Security

Francisco R. Bayo and Joseph F. Faber, *Actual Replacement Rates for Disabled-Worker Beneficiaries*, Actuarial Note No. 94, Social Security Administration, Baltimore, Maryland, January 1978, pp. 14.

This note contains tabulations of actual replacement rates for disabled-worker beneficiaries, based on a sample of initial awards made in October 1976. Distributions of actual replacement rates for various measures of earnings prior to onset of disability are tabulated by age, sex, and benefit amount. A table of theoretical replacement rates assuming the provisions of the 1977 Social Security Amendments illustrates the effect on benefits to young disabled workers.

Copies of this note may be obtained free of charge from the Office of the Actuary, Social Security Administration, Baltimore, Maryland 21235.