The Actuary
The Newsletter of the Society of Actuaries
VOL. 17, No. 4 APRIL, 1983

MATH EXAM PRIZEWINNERS

(This is the second of two articles.)

The tabulation in our March issue summarized the experience from among 233 prizewinners of the 24-year period 1947-70. Forty-two of them became Fellows.

In this article we examine these same 233 people in terms of the academic institutions from which they wrote the prizewinning examinations.

We look at each college from what may be regarded as a purely selfish professional viewpoint, i.e., in terms of how many of the 42 Fellows came therefrom. The figure shown parenthetically after the institution's name gives the number of its prizewinners out of which the Fellows emerged.

Colleges That Gave Us 4 Fellows
Yale (10); Toronto (29)

Colleges That Gave Us 3 Fellows
Drake (3), i.e., a perfect record; Michigan (5); Harvard (42).

Colleges That Gave Us 2 Fellows
Dartmouth (2), perfect; Iowa State (2), perfect; M.I.T. (20).

Colleges That Gave Us One Fellow

Alabama (1)	Minnesota (2)
British Columbia (1)	C.C.N.Y. (3)
Carnegie Tech (1)	Columbia (3)
George Washington (1)	Rutgers (3)
Iowa (1)	Trinity (3)
Purdue (1)	Manitoba (4)
Victoria (1)	McGill (4)
Brooklyn (2)	Queen's (4)
Chicago (2)	Brown (8)
Haverford (2)	

Thus, the 42 Fellows were yielded by the above-listed 27 institutions. For what it may be worth, the colleges that yielded these positive results produced 160 prizewinners, giving a ratio of 26 percent. Thirty-four other institutions produced, among them, 73 prizewinners but, so far, no Fellows. E. & O.E.

E.J.M.

INSURING AN END TO WHAT?

by Daphne D. Bartlett

"Insuring an End to the Actuarial Rip-Off of Women" headlined an article by syndicated columnist Ellen Goodman in the March 3rd *Los Angeles Times*. It was about Risk Classification, one of the most important issues ever to confront our profession. Pricing of risks is, after all, among the actuary's major responsibilities.

Such well-intentioned arguments in favor of unisex pricing for individual contracts can just as easily be applied to age or to state of health. Are we actuaries ripping off women, old people, sick people? I think not, and I'm concerned by the harm that articles such as Ms. Goodman's do.

If there are alternatives to unisex pricing that would meet the social concerns while preserving the actuary's ability to price according to the cost of the risk, actuaries are the ones to find them. Readers, I urge you to get involved, and to make your considered views known in the press and in the legislative arena.

Who else is going to see that these questions get balanced treatment? □

UNFAIR GAMBLING PRACTICES ACT OF 1983

Ed. Note: We are indebted to Allan Hale Johnson for bringing this otherwise unidentified document to our attention.

It has come to our notice that unfair practices have been taking place in betting on horse races. We find that our race tracks are paying returns *that depend on which horse wins!*

Consider the results from last Tuesday's 9th race at Old Mud Swamp Race Course, illustrating the deceptive practices perpetrated at this track, and indeed in the entire racing industry:

(Continued on page 2)

STEPS IN CREATING STUDY NOTES

by Sam Gutterman,
Education Committee Chairman

Step 1: Author

Once need for a new or revised study note has been identified—perhaps by the Education Committee, Director of Education, or a Task Force—one or more qualified and willing authors must be found. The author, usually an FSA, normally is an expert in the area. Nominations may come from the Education Consultant, from discussions with other experts, or from the Society's volunteer list that was solicited a year ago.

Step 2: Review Group

The size of the review group, maybe six or more, depends on the effort's scope. Leading candidates are the topic's Education Consultant, representatives of the Part Committee, the Education Coordinator, the Education Vice-Chairman, and someone named by the Canadian Institute of Actuaries. Other selected authorities and Society or Academy committees close to the subject may also read the study note

Step 3. Education Committee

After the reviewers' recommendations have been dealt with, the note comes to the Education Committee for acceptance, rejection, or referral back to the drawing board. □

SOCIETY OFFFICE MOVING SOON

After May 15th, our headquarters address will be:

500 Park Boulevard
Itasca, IL 60143

Details accompany this issue.

The Actuary

Editor . . . . . E. J. MOORHEAD Correspondence should be addressed:
Associate Editors . . . MICHAEL B. MCGUINNESS, JOSEPH W. S. YAU, DEBORAH ADLER POPPEL — *The Actuary*, Box 780, Bermuda Run, NC 27006, Tel: (919) 998-5335
Competition Editor . . CHARLES G. GROESCHELL
Editor Emeritus . . . ANDREW C. WEBSTER

Published monthly (except July and August) by the SOCIETY OF ACTUARIES, 208 S. LaSalle St., Chicago, Illinois, 60604, Barbara J. Lautzenheiser, President, Kenneth T. Clark, Secretary, Robert J. Johansen, Treasurer, Edward J. Porto, Director of Publications. Non-member subscriptions: students, $4.50; others, $5.50.

The Society is not responsibe for statements made or opinions expressed herein. All contributions are subject to editing. Submissions must be signed.

EDITORIAL

WHAT WERE THEY LIKE ?

The unavoidable coldness of the listing of our profession's earliest practitioners (this issue, pages 4 & 5) needs to be thawed by some attempt, inadequate though it must be, to convey what kind of people our forebears were.

One major characteristic is that, unlike most of us, many brought with them the stamp of previous business or professional experience they had had before becoming actuaries.

Of course they had to be self-reliant. As Ray D. Murphy, the Society's 1939 President, remarked: "The actuary of 1889 and earlier was left entirely to his own devices, with the aid of publications of predominantly British origin, to obtain the fundamentals of the profession".

Surprisingly to this observer, few came from other lands. The only ones in our list identifiable as born elsewhere are: Hugh C. Baker (Ireland), John F. Entz (Switzerland), Charles Gill (England), Robert Patterson (Ireland), Alexander G. Ramsay (Scotland), Harvey G. P. Tuckett (England). Mr. Tuckett came to the U.S.A. in a hurry after engaging in a duel with the Earl of Cardigan (later to lead the disastrous charge of the light brigade at Balaklava).

Happily, available to us in *T.A.S.A.* 40 (1939) are some delightful personality sketches by Robert W. Huntington of several leading actuaries of the 19th century, from which come these fragments:

> "Affairs and men were not as highly standardized as they are at present. Many members of the Society had come into actuarial work because they happened to, and very picturesque individuals they were.
>
> (About Emory McClintock): (He was) a large impressive man wearing mustache and goatee, quite formal in his manner and appearance, earnest and kindly. . . . I always had the feeling that he had one trait in common with the late President Eliot of Harvard, who, when walking home from a meeting, remarked, 'That was a particularly good meeting—no humor'.
>
> (On Walter C. Wright): A son of Elizur Wright, he was one who did not let convenience or business advantage interfere with theory. The dividends of the New England Mutual used to be calculated by Mr. Wright on a formula of his own and paid each year in strict accordance with the formula, so that even if the difference in the total earnings from one year to another was only a few dollars, the dividend on every policy at every age had to be recalculated.
>
> (On William D. Whiting): (An observer) said that he had a wonderful brain but his breastbone was made out of marble. This, however, was not the fact; I think he got this impression because Mr. Whiting (an insurance department actuary) had been more strict than we were used to in his examination of the company."

Would that we had such sidelights on more of our pioneers.

E.J.M.

Unfair Gambling Practices Act

(*Continued from page 1*)

Horse	*Bets Placed*
Soon To Be Glue	$ 1
National Velvet	$ 70
My Friend Flicka	$ 29
Winners' Pool	$ 100

National Velvet won. The pool—admittedly a fine total, there being no deduction even for expenses—was distributed to the holders of tickets on that horse in the ratio of $100 to $70, i.e., $1.43 per $1 bet.

This is grossly unfair! There were three horses, so the winning ticket should have paid $3 per $1 bet. When we questioned the track management on this point, they fed us some theoretical argument that the pay-off is based on something called "odds". They said that if Soon To Be Glue had won, the only bettor would have been paid $100 on his $1 bet! What kind of a scam is going on here?

Management said that differences in racing ability—they called it "form"—caused more people to place bets on National Velvet than on Soon To Be Glue. Their argument was that if the pay-offs were to be identical per $1 for all horses, eventually all bets would be placed on the favorite; this would lead to a purse of only $1 per $1 bet, which would ruin the racing industry.

The industry is crying wolf. We agree that National Velvet is the swifter horse, and hence would beat Soon To Be Glue on an *average day*, but they fail to recognize that nobody can predict accurately what will happen until the race has been run. It is unfair to base the pay-off on past results which merely show that *on the average* fast horses beat slow horses.

And when you consider that more people bet on National Velvet than on Soon To Be Glue, this unfair treatment becomes socially unacceptable. 70% of the bettors were discriminated against! We can't let the theory of odds override important social issues that adversely affect 70% of the population. That National Velvet is a swift horse isn't the fault of those who bet on her—nor is it their fault that more people bet on her than on Soon To Be Glue.

(*Continued on page 3*)

Unfair Gambling Practices Act

(Continued from page 2)

Furthermore, those who bet on My Friend Flicka, which came in second, were also discriminated against. The race was 1,000 lengths long. My Friend Flicka finished 50 lengths behind National Velvet, which means that My Friend Flicka completed 950 lengths in the same time that National Velvet completed 1,000 lengths, only a 5% difference. So it's grossly unfair that National Velvet returned $1.43 while My Friend Flicka returned nothing. Those who bet on My Friend Flicka should have received 95% of $1.43.

Here again, the industry started talking about "odds". They said that if My Friend Flicka had won, the pay-off would have been $100/$29, i.e., $3.45. But this is all wrong—the pay-off should have been at most 5% larger than on National Velvet because she's only 5% faster than My Friend Flicka.

I plan to introduce legislation to correct the industry's problems. My bill will require that the winner's purse per $1 bet not vary according to how many bets were placed on a particular horse, nor upon what the industry calls "form". This requirement won't apply to races already run for which purses have been distributed—but it will govern all future races, including those for which bets have already been placed.

The industry's objection to applying this legislation to future races for which bets have already been received is that this would be unfair to those who placed bets on long shots when the understanding of how winnings would be distributed was different. This is a smokescreen. The industry can solve this problem by paying out winnings equal to the greater of those under my system or the old system.

This practice of discriminating against swift horses must end !! □

Deaths

Bohdan M. Chesiuk, F.S.A. 1978
Michel Giasson, F.S.A. 1974
Frank W. Lackie, F.S.A. 1978
Lester H. Vetter, A.S.A. 1947
William H. Wetterstrand, A.S.A. 1976

AN ACTUARIAL QUIZ OF LONG AGO

by John C. Angle

The 7th Annual Report (1866) of the New York Superintendent of Insurance, available in the New York Public Library, includes the following story:

> "The Superintendent has recommended the passage of (an) act establishing the English Life Table No. III for males as the legal standard of expected mortality, and the assumed interest rate of five percent . . .
>
> "As preliminary to legislation . . . , the Superintendent addressed a Circular Letter to the Actuaries and Presidents of the Life Insurance Companies transacting business in this state, requesting their opinions as to the best Table of Mortality, and the proper rate of interest to be assumed in making valuations and other obligations of American Life Insurance Companies. . . ."

The Superintendent, William Barnes, had enclosed with his Circular Letter valuation information—age at issue, month and year of issue, face amount, plan—for each of 17 policies for $68,000 issued between 1833 and 1864. Numerous responses came in, including "a communication from Mr. John Paterson of Albany, an eminent Scholar and Mathematician" (possibly father of the John S. Paterson, born 1848, who became actuary of that same insurance department in 1883), but just six actuaries submitted valuations of those 17 policies, giving the following results:

Name & Title Given	*Basis Used*	*Calculated Reserve*
C. F. McCay, Augusta, Georgia	His own table, 4%	$ 9,723.51
Consulting Actuary of the Southern Mutual Life Insurance Company		
John F. Entz, New York	English Table 3, 5%	10,785.67
Consulting Actuary of the National Life Insurance Company of New York		
Hon. Elizur Wright	Actuaries, 4%	8,928.39
Consulting Actuary of the Knickerbocker Life Insurance Company of New York		
Sheppard Homans	English Table, 3, 5%	8,018.21
Actuary of the Mutual Life Insurance Company of New York		
D. P. Fackler	Actuaries, 5%	8,097.00
Actuary of the Brooklyn Life Insurance Company of Brooklyn		
Wm. J. Coffin	(i) English No. 2, 4%	8,808.03
	(ii) English No. 3, 5%	8,817.69
Actuary of the Home Life Insurance Company of Brooklyn		

Sheppard Homans, a quarter-century later to become the first President of the Actuarial Society of America, submitted the lowest valuation, but that by David P. Fackler (fated to succeed Mr. Homans) was only slightly higher. The conservatives proved to be the southerner, Charles F. McCay, and John F. Entz of New York. It is noteworthy that the lowest and highest valuations were arrived at from identical mortality and interest assumptions; Entz, though, loaded his single premiums by 33⅓% before deducting the present value of future valuation premiums, which were gross premiums less anticipated renewal expenses.

I enjoyed reading the clear and forceful writing of William Barnes (1824-1913), the influential first Superintendent of the New York Department. J. Owen Stalson seems correct in his verdict (*Marketing Life Insurance: Its History in America*, p. 346) on our "wonderful good fortune of having Wright and Barnes in office" during the formative years of life insurance. □

FALL EXAM STATISTICS

	Part 1				
	Passed	*C.R.E. Credit*	*Total*	*New Associates*	*New Fellows*
Nov. 1980	588	30	618	280	226
Nov. 1981	585	23	608	230	179
Nov. 1982	669	28	697	197	118

For May and November 1982 combined, the number of Part 1 Passers was 1,336. This means that the long downward trend reported by Linden N. Cole (June 1982 issue) has been at least interrupted, if not reversed.

ACTUARIES WHO PRACTICED IN NORTH AMERICA UP TO 1869

This tabulation, by company, of actuaries who flourished more than 20 years before the Actuarial Society of America was organized in April 1889, is by way of being a second progress report—see our May 1982 and September 1982 issues. Credit for accomplishment belongs to many actuaries, actuarial students and other friends who have unearthed particulars from libraries, newspaper obituaries, and archives.

The eventual value of this project comes hardly at all from listing names, dates and places, but from the flavor of the kinds of men and women these were, and what they did for our profession under the conditions of their times. The final report will aim to describe these people and their endeavors.

In this list, each company's present name is used. The symbol "Soc." denotes eventual membership in the Actuarial Society.

Corrections and additions will be welcomed. Particularly, we urge that somebody in each life company that is still active please check that company's data.

Earliest Year Practiced in Company Shown	Name	Dates of Birth & Death
Aetna (founded 1853)		
1867	Howell W. St. John (Soc.)	1834-1924
American Life & Health Insurance Company (1850-90)		
1850	John C. Sims	unknown
Asbury Life of New York (1868- ?)		
1868	Emory McClintock (later Soc.)	1840-1916
Berkshire Life (f. 1851)		
1860s	Benjamin Chickering	unknown
	James M. Lee, this company's actuary in 1879, became its first Society member.	
Canada Life (f. 1847)		
1847	Hugh C. Baker, F.I.A. 1852	1818-59
1858	Alexander G. Ramsay, F.I.A. 1864, (Soc.)	1829- ?
Charter Oak Life Insurance Company (1850-86)		
1860s	Levi W. Meech	1822- ?
Connecticut Mutual (f. 1846)		
1846	Guy R. Phelps	1802-69
1860s	O. W. Powers	unknown
1865	Thomas W. Russell	1824-1901
1868	Edwin W. Bryant (later Soc.)	unknown
	Daniel H. Wells, company's actuary in 1881, became its first Society member.	
Equitable Life & Trust Company (Pa.) (1848-52)		
1848	Harvey G. P. Tuckett	? -1854
Equitable Society (f. 1859)		
1859	George W. Phillips (Soc.)	1827-98
Girard Life Insurance, Annuity & Trust Company (1836-94)		
1836	John F. James	1802-71
Globe Mutual Life Insurance Company (1864-79)		
1864	Pliny Freeman	1798-1879
Guardian Life Insurance Company (f. 1860)		
1860	John F. Entz	1798-1872
	Hubert Cillis, company's actuary in 1871, became its first Society member.	
Home Life (f. 1860)		
1860s	William J. Coffin	unknown
	William A. Marshall, company's actuary in 1887, became its first Society member.	
Manhattan Life (f. 1850)		
1851	Nathan D. Morgan	unknown
1860	Samuel N. Stebbins (Soc.)	1819-89
Massachusetts Hospital Life Insurance Company (1818-67)		
1823	Nathaniel I. Bowditch	1776-1838
Massachusetts Mutual (f. 1851)		
1851	Francis B. Bacon	? -1870
1869	James Weir Mason (later Soc.)	1836-1904
	Oscar B. Ireland, company's actuary in 1872, became its first Society member.	
Metropolitan Life (f. 1866)		
1869	James M. Craig (Soc.)	1848-1922
Michigan Mutual Life Insurance Company (period unknown)		
1869	George W. Sanders (Soc.)	1845-1933
Mutual Benefit Life (f. 1845)		
1849	Charles Gill	1805-55
1857	Joseph P. Bradley	1813-92
1863	Amzi Dodd	1823-1913
	Bloomfield J. Miller, company's actuary in 1871, became its first Society member.	
Mutual Life of New York (f. 1842)		
1849	Charles Gill	1805-55
1855	Sheppard Homans (later Soc.)	1831-93
1859	David P. Fackler (later Soc.)	1841-1924
1889	Emory McClintock (Soc.)	1840-1916
National Life Insurance Company of the U.S.A. (1868-1933)		
1868	Emerson W. Peet	unknown
	Joseph H. Nitchie, company's actuary in 1874, became its first Society member.	
National Life of Vermont (f. 1848)		
1865	Edward Dewey	1829-1900
	Joseph A. DeBoer, company's actuary in 1889, became its first Society member.	
New England Mutual Life (f. 1835)		
1860s	Joseph M. Gibbons	unknown
1866	Walter C. Wright (Soc.)	1846-1917
New Jersey Mutual Life Insurance Company (1863-77)		
1860s	Henry W. Smith (later Soc.)	1836-98
1863	Joseph P. Bradley	1813-92
New York Life Insurance & Trust Company (1830-65)		
1830	William Bard	1778-1853
New York Life (f. 1843)		
1845	Pliny Freeman	1798-1879
1864	William H. Beers	1823-93
1860s	Preston S. Lincoln	? -c. 1883
	Rufus W. Weeks, company's actuary in 1883, became its first Society member.	
North American Life Insurance Company of New York (1862-75)		
1860s	Isaac J. Merritt	unknown

ACTUARIES WHO PRACTICED IN NORTH AMERICA UP TO 1869

(Continued from page 4)

Earliest Year Practiced in Company Shown	Name	Dates of Birth & Death
Northwestern Mutual (f. 1857)		
1867	Edward Ilsley	1798-1886
1871	Emory McClintock (later Soc.)	1840-1916
	Charles A. Loveland, company's actuary in 1889, became its first Society member.	
Pennsylvania Company for Insurances on Lives & Granting Annuities (1812-72)		
1812	Jacob Shoemaker, Jr.	1758-1822
1831	Joseph Roberts, Jr.	unknown
1836	Sears C. Walker	1805-53
1850s	William B. Hill	unknown
Penn Mutual (f. 1847)		
1847	John W. Hornor	1809-73
1859	Lewis Merrill	1834-96
1872	James Weir Mason (later Soc.)	1836-1904
	Jesse J. Barker, company's actuary in 1880, became its first Society member.	
Phoenix Mutual (f. 1851)		
1863	Henry Gay	unknown
1864	James F. Burns	unknown
	John M. Holcombe, company's actuary in 1874, became its first Society member.	
Presbyterian Ministers Fund (f. 1759)		
1792	Robert Patterson	1743-1824
	Robert P. Field, company's actuary in 1884, became its first Society member.	
Provident Mutual (f. 1865)		
1865	Rowland Parry	1805- ?
	Asa S. Wing, company's actuary in 1873, became its first Society member.	
Security Life Insurance & Annuity Company of New York (1862-76)		
1860s	Theodore R. Wetmore	unknown
State Mutual (f.1844)		
	William E. Starr (1812-1903) who gave mathematical guidance to this company in 1848 though not himself actuarially trained, became its actuary in 1870 and its first Society member.	
Southern Mutual Life Insurance Company of Georgia (1847-1856)		
1848	Charles F. McCay	1810-89
Union Central Life (f. 1867)		
1867	Norman W. Harris	1846-1916
	Elbert P. Marshall, company's actuary in 1888, became its first Society member.	
Union Mutual Life (f. 1848)		
1866	Lucy J. Wright	1842-67
	Samuel S. Boyden, company's actuary in 1892, became its first Society member.	
United States Life (f. 1850)		
1850s	Nicholas G. DeGroot	? -1885
1869	William D. Whiting (later Soc.)	1844-99
	William T. Standen, company's actuary in 1886, became its first Society member.	
United States Insurance, Annuity & Trust Company (1850-62)		
1850	Pliny Fisk	unknown
Washington Life Insurance Company of New York (1860-1908)		
1865s	William A. Brewer, Jr.	1835- ?
	Israel C. Pierson, company's actuary in 1879, became its first Society member.	
Widows' & Orphans' Benefit Society (1864-71)		
1860s	William P. Stewart	unknown
Consulting Actuaries Who Practiced Up To 1869		
1840s	John F. Entz	1798-1872
1840s	T. Russell Jencks	unknown
1844	Elizur Wright	1804-85
1848	Charles F. McCay	1810-89
1849	Ezekiel B. Elliott	1823-88
1865	David P. Fackler	1841-1924
1868	William Sheffler	unknown
Insurance Department Actuaries Who Practiced Up To 1869		
1850s	Ezekiel B. Elliott, Massachusetts	1823-88
1858	Elizur Wright, Massachusetts	1804-85

E.J.M.

UNIVERSAL LIFE GAAP—A SURVEY

by Douglas C. Doll

Some companies are approaching the problem of how to accommodate Universal Life in GAAP statements thus:

> Use a simple method producing not unreasonable results, and wait for consensus on appropriate methodology to develop.

Has that consensus formed? Not yet, says a mini-survey we've just conducted. Among eleven reporting companies there are as many as nine procedures.

Six companies set GAAP benefit reserves equal to the accumulated fund, and defer any excess of acquisition expenses over additional first-year loadings. Their amortizations of deferred acquisition costs are:

1. Over premiums (3 cos.)
2. Over cost of insurance charges (1)
3. Over in-force volume (1)
4. Ten years straight line (1)

Four companies calculate benefit reserves, and generally try to develop GAAP earnings, as level percentages of premiums. Large margins for adverse deviations in assumptions would still cause a material part of earnings to be reported as earned. Three use projections and apply ratios of benefit reserves to the accumulated fund. The fourth solved for the year-end benefit reserve that would generate the expected earnings expressed as a percentage of premiums.

One company proposed a pure release-from-risk approach. Its benefit reserves are equal to the accumulated fund; all acquisition expenses are deferred and amortized over all sources of earnings.

Readers wishing more details, or willing to contribute their approach to this list, please write or phone me at my Yearbook location. □

THE SECOND NOTATION PROPOSAL FROM DOWN UNDER

by Frank G. Reynolds

(This is Article No. 8 in a series)

In March 1976, a subcommittee of the Institute of Actuaries of Australia and New Zealand put forward another actuarial notation proposal. As its authors said:

> "This suggestion has the characteristic of being largely self-explanatory once the basic concept is understood, and reduces to simple expressions for the common cases. Most importantly, it depends on very few arbitrarily defined conventions."

Its principal conventions are these:

1. Reference to a life x means, "when an event occurs to a life aged x".
2. An assurance function consisting of a payment on a given event has the form, "A (payment event)", while an annuity function consisting of a series of payments ending on a given event has the form, "a (end of annuity payments event)".
3. The symbol, #, preceding a number, identifies it as fixed period of years rather than as an age.
4. The signs customarily used to indicate "greater than" and "less than" are used to show the order of events in, e.g., multiple life functions.
5. When used within a function's argument, certain key letters have established meanings, an easily understood example being "i = 5%".
6. The word "and" is denoted by the customary & (ampersand).

The following examples illustrate the system:

Present	Proposed
$A_{xy\,12}^{\,3\,zw}$	A(z>(y>x)&<w)
$A_{x:\overline{n}\rceil}$	A(x,#n) or A(x,#n,h=1)
$A_{\overline{xy}}$	A(x&y)
${}_{n}P_{xyz...}^{\quad r}$	p(xyz...,h=t>#n) where t+r is the total number of lives.
${}_{n}p_{x}$	p(x>#n)
${}_{n}q_{x}$	p(x<#n)
P_{x}	PA(x)
$P'_{x:\overline{n}\rceil}$	PA(x<#n)
${}_{t}V_{x}$	V(t,PA=x)
${}_{t}^{k}V_{x:\overline{n}\rceil}$	V(t,A=x,#n,P=x,#k).

Attractive properties of this notation are its close resemblance to the present one, its flexibility, its neat handling of complex stati, and its identifying the nature of the function in the opening letter. On the other hand, it isn't compatible with the computer, partly because it employs both upper- and lower-case letters.

Although not free of drawbacks, this proposal seems the soundest to have emerged. □

LETTERS

Fellowship Syllabus

Sir:

History, even on matters such as the exam restructuring of the 1970s (Linden Cole's article, Jan. issue), can be seen through different eyes.

That 1976 change represented, to us intimately involved, an attempt to replace the prior building block concept—i.e., amassing items of fact in anticipation that the student would use them in a process of inference—by the teaching of actuarial science as a conceptual study from which deductive conclusions could be drawn.

Admittedly, pensions didn't fit easily into this conceptual structure, but our plan was first to put that structure into place, then to produce new study materials that would take care of the pension difficulty.

Later events conspired against this approach. The major one was passage of ERISA in 1974, with its requirement that certain "building block" factual examinations—just the type we'd planned to get rid of—must be passed to become an Enrolled Actuary. This led to further reorganization of the Fellowship parts with the results we see today.

Many are pleased with this because a student can complete the enrollment requirements without taking further exams; others are unhappy because it has distorted a well thought out exam pattern.

The issue here is the distinction between amassing of facts and assimilation of concepts. If the latter rather than the former is what we need, then in some respects the 1981 restructuring was a step backwards.

Charles Barry H. Watson

(Continued on page 7)

SUMMARY OF NEW SOCIAL SECURITY PROVISIONS

Extraordinary devotion by Robert J. Myers has made available already his latest "Summary of Provisions" that covers the large changes that Congress has just enacted. Request a gratis copy from Mr. Myers at 9610 Wire Avenue, Silver Spring, MD 20901. But don't impose on his generosity by asking for multiple copies—please do your own duplicating.

ELECTION COMMITTEE INVITATION

Fellows who have the experience, interest and time to serve on the Board of Governors, but think our Committee might overlook them when compiling the customary first ballot listing, are cordially invited to write to me *before May* 2nd summarizing their accomplishments and background.

Robin B. Leckie
Chairman,
Committee on Elections

Letters

(*Continued from page* 6)

Cruelty To Readers

Sir:

I'm sure that economic considerations influence selection of type sizes for Society publications, such as the *Record* and most recently "A Strategic Premise for Actuarial Education". And I suppose people like me can get bifocals or buy a magnifying glass.

But, mightn't the Society consider a minimum standard such as that now generally used in the *Transactions* or in *"The Actuary"?*

C. Lee Fischbeck

* * * *

Falling By The Wayside

Sir:

Linden N. Cole (Jan. issue) didn't mention one problem for pension actuaries in the 1976 exam restructuring—its timing. That change was announced at about the time ERISA passed; the transition period coincided with time-killing efforts to conform our clients' plans to the new legislation.

Faced with either passing four partials or losing Parts 6 through 8, I applied for Fellowship in the Conference. I wonder how many other career Associates reached a similar decision.

Frank D. Repp, Jr.

* * * *

Actuary's Cranium

Sir:

The way in which you identified the Actuarial Society members in the 1893 photo (Nov. 1982 issue) reminds me of a similar occurrence at the first meeting I attended as a Fellow more than 60 years ago. On that occasion the key to the names was simply a reproduction of the official picture, with the features of each face blocked out and numbers inserted.

This led a non-actuary to say, "I could tell readily that that was a group of actuaries: nothing in their heads but figures".

James E. Hoskins

(*Continued on page* 8)

LEAST SQUARES, CONVENIENTLY

by Peter S. Kornya

When in the course of preparing statements it becomes necessary to estimate a minor item from prior years' data, here's a quick method easily taught to non-statisticians:

Rule: To arrive at the weights, just double the number of prior values and subtract two to get the weight for the last observed value. Count back by threes to get the other weights. For example, if five past values are used, the weight for the most recent such value will be 8, and the arithmetic will be:

Year	*Observed Value*	*Weight*	*Product*
1978	$ 11,102	−4	−44,408
1979	13,347	−1	−13,347
1980	9,006	2	18,012
1981	15,175	5	75,875
1982	17,222	8	137,776
		10	173,908
		Estimated Value	$17,391

If the entire regression line is needed, apply the rule in reverse. In this example, an extrapolated value for 1977 emerges at $8,950, and the estimated average annual increase will be $(17,391 - 8,950) \div 6 = \$1,407$.

Although quite easily verified from the least squares formula, this method seems not widely known—meaning that I haven't come across it before. □

JOINT AND SURVIVOR FACTORS

by Ralph Garfield

In defined benefit plans, ERISA requires that the normal form of the pension must be on a qualified joint and survivor basis. This means that a pension is payable to the plan participant with at least 50% of it continuing to the participant's beneficiary.

Often the plan will define the pension in terms of a lifetime pension to the participant only. To compute the required qualified joint and survivor pension, the lifetime pension must be multiplied by a factor which we call "Joint and Survivor Factor."

For example, if we define f(100) as the 100% joint and survivor factor, i.e., the factor which when applied to the participant's lifetime pension produces a pension to the participant with the same amount (100%) continuing to the participant's beneficiary, then it is clear that if x is the age of the participant and y the age of the beneficiary then:

$$f(100) = \frac{\ddot{a}_x}{\ddot{a}_{xy}}$$

An often posed question is what happens to f(100) if the interest rate changes. The well known answer is that as the interest rate increases, f(100) increases and vice versa. A simple way to verify this is as follows:

$$f(100) = \frac{\ddot{a}_x}{\ddot{a}_x + \ddot{a}_y - \ddot{a}_{xy}}$$

Now choose a particular set of mortality rates for y, namely, y is immortal. Clearly under this assumption

$$\ddot{a}_y = \frac{1}{d} \quad \text{and} \quad \ddot{a}_{xy} = \ddot{a}_x$$

Thus:

$$f(100) = \frac{\ddot{a}_x}{\ddot{a}_x + \frac{1}{d} - \ddot{a}_x}$$

$$= d\ddot{a}_x$$

$$= 1 - A_x$$

It is clear that as i increases, A_x decreases and $1-A_x$ increases. Note also that since f(p), i.e. the p% joint and survivor factor, equals:

$$\frac{f(100)}{(1 - \frac{p}{100})f(100) + \frac{p}{100}}$$

and the derivative of this factor with respect to f(100) is positive, the same result holds for the p% joint and survivor factor. □

WHAT SERVICES DO YE SEEK?

While cordially welcoming members' responses to our March issue advt. for continuing education ideas, we now solicit suggestions on ANY services you'd like the Society to introduce or improve. Send them to my Yearbook address.

Robert D. Shapiro, Chairman
Services to Members Policy Committee

Letters

(*Continued from page 7*)

The Dropping Out Hazard

Sir:

Attempting to look at the Society's syllabus as it influences the decisions of young people aspiring to become consulting actuaries in the employee benefit area, I find several causes for grave concern:

1. I believe the exams are too difficult to pass—much worse than when I battled through them from 1967 to 1976.
2. The people who are establishing the course of reading are out of touch with the consulting actuary's world.
3. The exam parts are inconsistently administered. Part 1 is too easy, Parts 4 and 7E too difficult. I have the impression that well prepared students who should pass them are not passing.
4. The increased emphasis on statistics in the Associateship exams is inappropriate, especially for pension actuaries.

The danger is that actuarial students won't sit for the Society exams, but will content themselves with Enrolled Actuary status. As a vivid example: Thirty-five students attended a recent seminar for Part 7EA (the Enrollment exam), but only five of them were sitting for 7EB, the Fellowship or non-Enrolled Actuary portion.

The staff in our own firm provides additional evidence. Of our four actuaries other than myself, one is an E.A. and an M.A.A.A., but not a Society member; one is an A.S.A. who intends to seek E.A. but not F.S.A. status; one has three Society exams and is going after E.A., but not even A.S.A.; only one, a 24-year-old with four exams, intends to become a Fellow.

What this suggests to me is that my nine years of hard work for Fellowship will become meaningless. What it means for the Society is that future pension actuaries won't become Society members but will look to such organizations as ASPA.

Dorn H. Swerdlin

Grasping Life Contingency Principles

Sir:

Drs. Broffitt and Klugman (Jan. issue) helpfully analyze some theoretical life contingency and compound interest details often overlooked. Some may regard these of little practical value, but I consider them important in helping us see things in greater depth, and thus sharpening our understanding and analytical abilities.

But I don't completely accept Dr. Broffitt's thesis of a fallacy in Jordan's intuitive argument. Broffitt's analysis considers monthly payments of $\frac{1}{n}P_x$ rather than the $\frac{1}{n}P_x^{(n)}$ that I believe should be used. I agree that the insured is making correct net premium payments with the latter, but I understand Jordan's argument to be that, *compared to paying annual premiums for a benefit payable at the end of the year of death*, the premium $P_x^{(n)}$ must be greater than P_x to account for receiving premiums spread over the year, and for not receiving a full year's premium in the year of death. There is difficulty, though, with Jordan's argument when you have immediate payment of claims; this is discussed in a note to appear in ARCH.

$$P_x^{(m)} \cdot \ddot{a}_x^{(m)} = A_x$$

$$\Rightarrow \quad P_x^{(m)} = \frac{A_x}{\ddot{a}_x^{(m)}}$$

$$\doteq \frac{A_x}{\ddot{a}_x - \frac{m-1}{2m}}$$

$$= \frac{P_x}{1 - \frac{m-1}{2m} \quad \frac{1}{\ddot{a}_x}}$$

$$= \frac{P_x}{1 - \frac{m-1}{2m} \quad (P_x + d)}$$

$$\Rightarrow \quad P_x^{(m)} \cdot \left(1 - \frac{m-1}{2m} \quad (P_x + d)\right) \doteq P_x$$

$$\text{or} \quad P_x^{(m)} \doteq P_x + \frac{m-1}{2m} \cdot d \cdot P_x^{(m)} + \frac{m-1}{2m} \cdot P_x \cdot P_x^{(m)}$$

Warren R. Luckner