THE Actuary

Actuarial examination candidacy and its effects on social relationships

by Stacey Brundin

This article is based on an independent study examining the effects that time spent studying for actuarial exams has on social relationships, especially marriage relationships.

A questionnaire was mailed to 83 persons who attended Lebanon Valley College (1) with a major of actuarial science or (2) with a math major and known to be working in an actuarial field. Lebanon Valley College is a small, church-related, liberal arts college.

Fifty-four responses were received, for an excellent return rate of 65%. The return from those known to be working in the field was 70%.

Consistent with male dominance in the actuarial field, there were responses from 37 males and 17 females, ranging in age from 22 to 44. The oldest male was 44 and graduated in 1965, while the oldest female was 29 and graduated in 1980. There were responses from 13 male Fellows (FSA or FCAS) and only one female Fellow. For information on marital status, see Appendix A.

The remaining information is based on tabulations which exclude three responses received from people who did not graduate from Lebanon Valley College and did not pursue an actuarial career.

Most respondents felt there was no link between their actuarial careers and their marital status. A few

Analysis of CDC AIDS case data

by Thomas W. Reese

The Centers for Disease Control (CDC) make available, at the end of each quarter, a computer diskette containing data about each AIDS case reported to date. A separate record for each reported AIDS case gives information about age, region of residence, type of infection transmission, month of diagnosis, reporting month, etc. Information is given only in broad categories, such as ages 13-29, so that individual cases cannot be identified. Sorting these records in different ways allows analysis that is not possible from the information in the CDC's weekly reports.

To relate the information more closely to the general insured population, I have made some analyses that exclude all intravenous drug abuser (IVDA) cases. That modification reduced the number of AIDS cases being analyzed by about 25%. Results discussed in the four studies below apply to this non-IVDA population unless stated otherwise.

Regional analysis

The distribution of today's AIDS cases represents infections as of some years ago, not current or future infections. Part of the higher prevalence of current cases in certain areas simply reflects an earlier introduction of the epidemic in some places.

For example, of cases diagnosed through 1982, over 42% of patients whose residence is known lived in the Northeast region's Standard Metropolitan Statistical Areas (SMSAs) of one million or more residents, while less than 14% were not residents of an SMSA with over one million population. Currently, however, only about 23% of these cases are from the Northeast region SMSAs, while the proportion not from an SMSA with more than one million residents has climbed to about 22%.

This is not to say that geographic variation isn't important. The AIDS concentration in the Northeast SMSAs, with under 8% of the total population in the 1980 U.S. census, is certainly greater than that of the non-SMSA population, with over 58% of

CDC AIDS case data cont'd

the population. Rather, the point is that geographic variation will likely become less significant. The prevalence of AIDS cases is generally increasing fastest in those regions where the prevalence rate is lowest.

Age distribution

Age distribution assumptions derived from total AIDS case data are irrelevant for some population groups.

For example, about 10% of total nonpediatric (ages 13 and above) AIDS cases are diagnosed at ages 50 and above. When IV drug abusers are removed, however, that percentage changes to over 12%. Further, the percentage in this age group ranges from about 9% for males classified by the CDC as homosexuals to about 15% for males classified as bisexuals to about 30% for males classified as heterosexuals. The percentage for females is about 20%. These results for heterosexual males and for females are mainly caused by the influence of blood transfusion cases, of which about 64% are diagnosed at ages 50 or older.

Of AIDS cases classified by the CDC as caused by heterosexual transmission, the proportion diagnosed at ages 13-29 is about 30% for males and 40% for females. These are significantly younger distributions than for homosexual and bisexual males, among whom about 21% of cases are diagnosed at ages 13-29.

Death rates

Michael Cowell and Walter Hoskins derived the familiar "45%-45%-35%-25%" pattern of death rates after AIDS diagnosis by analyzing data from the cases (including IVDA) reported to the CDC through the first quarter 1987. Comparing this formula's modeled deaths to the reported deaths (shown in Table 2 on page 20 of Hoskins's paper: "HIV Mortality") results in a ratio of actual deaths to expected deaths of about 104%.

We expect lower death rates now, since the CDC liberalized the definition of AIDS cases in the fourth quarter of 1987. Such a drop in AIDS death rates has occurred. Applying Hoskins's model to total CDC cases reported one year later, i.e., the end of the first quarter 1988, produces an actual-to-expected (A/E) ratio of only 95%. Removing IVDA cases leaves the ratio relatively unchanged at about 94%.

AIDS death rates vary for different population groups. For homosexual and bisexual males diagnosed at ages 13-29, the A/E ratio is only about 89%. For members of those groups diagnosed at age 50 or above, the ratio climbs to about 104% for homosexuals and to about 108% for bisexuals. For heterosexual males and for females diagnosed at age 50 or above, the A/E ratio is about 123%. For members of those groups diagnosed at ages 13-29, the ratio is only 86% for heterosexual males and 93% for females.

Reporting delays

AIDS cases continue to be reported with diagnosed dates in prior years. Several attempts have been made to analyze past reporting delay ratios to develop "IBNR"-type ratios that can be applied to currently reported case numbers to estimate the number of cases that will eventually be reported. The CDC's change in AIDS case definition makes historical ratios invalid, however. The new definition has added over 10% of current cases that would not yet have been reported under the former definition. In effect, the reporting of AIDS cases was accelerated beginning with the fourth quarter of 1987.

One potential problem with delays in reporting would be the distortion of death rate studies if AIDS cases that have already resulted in death are reported with less delay than those which have not. The individual case CDC data make a study of this hypothesis possible. While there is evidence that this occurred in the early AIDS reporting years, there is no evidence of such distortion in the data for the past few years. For example, cases reported through the second quarter 1988 show an average reporting delay for cases diagnosed in 1987 of 3.3 months for alive cases and 3.7 months for deceased cases.

Thomas W. Reese is a Consulting Actuary with Tillinghast/Towers Perrin.

G-523 exam rescheduled

The examination for Course G-523, Non-Pension Benefits for Retired Employees, has been rescheduled. It will now take place from 1:30-2:30 p.m., Thursday, November 3. It was previously scheduled from 8:30-9:30 a.m. that day.

Actuarial examination cont'd

persons waited to get married until after reaching a certain exam level, but this waiting period was short. Many participants had first met their spouses at work, and in this way their careers affected their marital status. These single persons were single by choice and did not feel that their career was involved in that choice.

Fifty-one percent of the respondents had no children. Twenty-five men said that taking the exams had no effect on the timing of the birthdates of their children, while nine men said they had delayed or were delaying children until after completing the exams or reaching a certain exam level. Of the women, eight said there was no effect and six said they had delayed or were delaying children for the exams. These results suggest that the woman is still the major caregiver in the family.

Only 10 responses came from persons no longer taking actuarial exams. Some said their social relationships with friends and family suffered, which contributed to their decision to discontinue the exams. Others said they stopped taking exams because their career goals changed, not because of the demands of studying. How many actuarial students stopped taking the exams and did not respond to the questionnaire is not known.

Many actuarial students said they spent as many as 20 hours a week preparing for actuarial exams. This varied a great deal, with some spending as little as six hours and others as many as 35. There was some indication that more time was spent on the upper-level exams.

Almost everyone felt that the amount of time spent studying reduces the amount of time left for social relationships and activities, especially in the two months before each exam (April and October). Many students socialized with each other either for studying or non-studying purposes, and in these cases an actuarial career created more social opportunities. Some respondents also said existing relationships are strengthened by the time spent studying, because the time spent in the relationship becomes better appreciated.

Most of the respondents used the space on the questionnaire provided for additional comments. A common theme was that an understanding spouse promotes exam success

through the added support brought to the relationship. Also, many of the respondents suggested that students spread out their studying evenly during the year, in order to reduce the stress of cramming close to exam time. Some of the more helpful comments are shown in Appendix B.

It is hoped that this study will help other students interested in an actuarial career. For those planning to have both a family and a career, this study highlights areas of possible conflict, but it also is encouraging in its optimism. Respondents indicated that the rewards of an actuarial career make the time spent worthwhile, and social relationships need not be overly sacrificed to achieve career goals.

APPENDIX A

Number of Responses

	Married		Single		Engaged	
	M	F	M	F	M	F
Fellow	11	1	2	–	–	–
Enrolled	1	–	–	–	–	–
Associate	5	–	3	1	1	1
Student	3	5	3	3	–	1
N.L.T.E.[1]	6	3	–	1	–	–
Not Applicable[2]	1	1	1	–	–	–

[1]No Longer Taking Exams
[2]There were three responses from people who did not graduate from Lebanon Valley College and did not pursue an actuarial career.

Also, two additional responses were received after the study was completed.

APPENDIX B

"I have observed that studying has a very large effect on those who are studying while married, and especially so for those who have kids. Marriage relationships and child rearing are much more time encompassing than dating if they are to be handled well."

"In reality, I think studying is actually more of an excuse than a good reason not to get married. Married people with no kids have the highest exam success ratio (by my observation) because they have the constant support and urging and because someone else can do the household chores."

"Most actuaries either go for the exams first, children later or vice versa. Very few can do both. (I do know of one female ASA who successfully stayed home with her infants to breastfeed and study.)"

"Your questions dealt mainly with the impact of studies on the relationship. I feel the relationship can have a bigger impact on the studies. For example, I got married after two exams. I saw the exams as unpleasant events that made it more difficult to have a normal relationship. So that

makes you redouble your efforts to get the exams over with as quickly as possible. You also need the support of the other person in the relationship."

"One problem that I encountered while taking the exams is that only actuaries and other actuarial students

New address, phone for Society

As of August 15, the Society of Actuaries has a new address and phone number. The address is 475 North Martingale Road, Suite 800, Schaumburg, Illinois 60173-2226. The main number is 312-706-3500. The FAX number is 312-706-3599.

The membership services office of the American Academy of Actuaries and the office of the Conference of Actuaries in Public Practice also have relocated to the new address. The new AAA telephone number is 312-706-3513, and CAPP's new telephone number is 312-706-3535.

Actuarial examination cont'd
realize the difficulty of the exams. People who were not actuaries could not understand why I had to study so much. The worst part was trying to explain to them how you studied so hard and failed the exam."

"A supportive spouse is a definite advantage in the quest to complete the exams!"

"Taking actuarial exams places an enormous burden on a marital relationship. It requires a very under-standing spouse to really make the combination work."

"I think it is important to realize that a successful actuarial career is possible even for people who place a priority on marriage and family."

"Stopping taking the exams was the best decision I ever made. There is more to life than taking tests and I am able to enjoy everything else that goes on around me."

"Even though exams take up a lot of time, I know that it will pay off in the end. My future is definitely worth the time spent. If a relationship (friendship, marriage, or any other type) can't survive exams, then it probably wouldn't survive any other crises either. There has to be a balance though. If you spend every spare moment studying, it will make you crazy."

Stacey Brundin, not a member of the Society, is a 1988 graduate of Lebanon Valley College and is an actuarial student with the Guardian Life Insurance Company of America.

Recent smoker/nonsmoker mortality experience

by James D. Brock

S moker mortality ratios are generally double the ratios for nonsmokers, according to the latest intercompany experience.

Fourteen companies reported smoker/nonsmoker experience separately for the 1984-85 individual life insurance mortality study compiled by the Committee on Individual Life Experience Studies. We have combined those results with the 1983-84 experience contributed by nine companies and previously reported by Harry Woodman in *The Actuary* in November 1987.

The differences in the ratios peak at issue ages 40-49 (Table 1). By duration the spread is highest in the first three durations, where most of the available experience is concentrated (Table 2). The exposures are predominantly male nonsmoker lives (Table 3). The "Unknown" category represents experience for which smoker/nonsmoker classification was not available. Expected deaths are based on the 1975-80 Select Basic Tables.

The smoker/nonsmoker analysis is an ongoing feature of the annual mortality studies published in the *TSA* Reports of the Society. Detailed tables for the 1983-84 and 1984-85 experience will be available later this year from the Society's Research Department.

James D. Brock is Senior Vice President and Actuary at The Prudential Select Marketing Company. He is a member of the SOA Individual Life Insurance Mortality Experience Study Committee.

ALL STANDARD ISSUES – EXPERIENCE BETWEEN 1983 AND 1985 ANNIVERSARIES

(Amounts shown in $1,000 units)

TABLE 1 – By Issue Age, Male and Female Combined

Age at Issue	Nonsmoker		Smoker		Unknown	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
0-19	$ 4,654	62%	$ 1,305	97%	$ 41,612	92%
20-29	34,432	66	13,104	109	93,722	96
30-39	88,656	73	40,286	144	172,269	89
40-49	84,906	70	49,304	170	221,431	98
50-59	72,836	82	33,314	171	179,487	100
60 plus	32,195	83	11,227	154	69,676	105
All Ages	$317,680	74%	$148,541	153%	$778,196	96%

TABLE 2 – By Duration, Male and Female Combined

Duration	Nonsmoker		Smoker		Unknown	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
1	$ 94,357	69%	$ 44,034	148%	$ 15,671	224%
2	93,356	71	43,668	153	25,606	145
3	64,025	67	30,320	146	47,232	126
4	41,398	98	17,596	168	64,979	99
5-15	24,543	100	12,923	171	624,709	92
All	$317,680	74%	$148,541	153%	$778,196	96%

TABLE 3 – All Issue Ages and Durations Combined

	Nonsmoker		Smoker		Unknown	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
Medical						
Male	$147,690	83%	$51,866	171%	$371,685	88%
Female	12,314	91	5,919	179	45,399	104
Total	160,004	84	57,785	172	417,084	90
Para-Medical						
Male	$ 70,045	64%	$44,098	159%	$149,773	104%
Female	11,162	70	7,033	161	30,878	111
Total	81,206	65	51,131	159	180,651	105
Non-Medical						
Male	$ 60,791	70%	$32,356	133%	$137,860	107%
Female	15,679	58	7,269	104	42,601	101
Total	76,469	67	39,625	127	180,461	105

Editorial

The actuarial job

by Daniel F. Case

What has been the impact on actuaries of their job's number-one ranking in *The Jobs Rated Almanac*? Have they encountered admiration, envy, skepticism? Has their own image of themselves been influenced?

Much depends on the nature of the stress factor, one of the six criteria involved in the *Almanac's* ratings. It was not immediately clear whether the most credit was given to the lowest-stress jobs or to the highest-stress ones. For example, there may be a correlation between low stress and boredom.

We found an answer in the first two quotes (Delgadillo and Krantz) in "Sightings I" in this issue. Actuaries have high-stress jobs. Recognizing that fact, their employers give them as good a work environment as possible. High stress and good work environment are each a favorable factor in the *Almanac's* job ratings.

Nevertheless, when our own employer offered a stress-management seminar recently, we declined to participate. We feared that some of our nonactuarial colleagues might not recognize the high degree of stress in our jobs and might be skeptical of our need for the seminar. Also, we felt that we did, in fact, not need the seminar. We have long experience in dealing with stress.

We first learned to handle stress, of course, through taking the actuarial exams. Lest any of our readers forget what that was like, we also print in this issue an article (by Stacey Brundin) on actuarial-exam-taking and its effect on the takers.

One reader (see the first letter in "Dear Editor," this issue) raises the possibility that some of the things that have characterized the actuary's job may be jeopardized by the publicity given to it. Possibly, actuaries should not welcome the type of publicity given them by the *Almanac*. Surely, however, they will welcome the type of publicity given to one member of the profession, Paul McCrossan, in the item which appears in "Sightings II" in this issue.

The Society has a Task Force on the Actuary of the Future, which is working hard to prepare recommendations on the future roles of the actuary and how to prepare and support actuaries for those roles. It is interesting to speculate on the difference between the recommendations the Task Force might present and the recommendations which it might have presented if the objective had been to preserve the number-one job rating of "actuary." If the Task Force envisions future roles of the actuary which are very different from the present roles, will filling those roles lead to a lower job rating?

Individual actuaries will, of course, seek whatever work best suits their own goals and abilities. The Society is there to help us, but our own jobs and the profession will be what we make of them.

Sightings I

The publication of *The Jobs Rated Almanac* and its choice of "actuary" as the best of 250 jobs were discussed briefly in the July/August 1988 *Actuary*. The event brought forth myriad newspaper references to actuaries, and several of our readers sent us some. Here are a few excerpts.

From Donald R. Sondergeld:

"Linda Delgadillo, director of communications for the Society, agrees. '...Actuaries are responsible for the financial solvency of insurance companies, pension plans and investment portfolios. These are not low-stress jobs, they are responsible positions.' " – Mike McGraw in the *Hartford Courant*, May 23.

From Lloyd K. Friedman:

"Anxious employers are eager to make the number-crunchers comfortable, Krantz [the *Almanac's* editor] said. 'They're analyzing make-it-or-break-it data. There are enormous stakes involved,' he said." – Susan Borreson in the *Houston Post*, May 20.

Also from Sondergeld:

"Ah, the word itself! Say it loud, and it's data-amalgamating. Say it soft, and it's almost like calculating....

"The positives are: Unconditional power over the lives and deaths of countless mortals. Wealth beyond all measure. Incredible chicks (or whatever)....

"I would have to think that even a physicist, third-ranked though he be, must lick his thin, pale lips with envy at the actuary's lot. I mean, after all, physicists are pretty much governed by the laws of the universe." – Colin McEnroe in the *Hartford Courant*, May 20.

From Sondergeld and Robert C. Tookey:

"Actuaries...interpret statistics to determine expected personal losses due to sickness or disability and material losses from disasters...." – Associated Press in various papers on May 19.

A photograph in the *Los Angeles Times* showed a cowboy (job #242) at work. The photograph was attributed to Randy Leffingwell. This photographer may have the best job of all, since, we've heard, Leffingwell is the best revenge.

Sightings II

Samuel Eckler and Nomi Goodman each sent us the following tribute:

"Wanted: One Actuary

Say Brian, isn't it time you graced that stumbling crew of lawyers and businessmen you call a cabinet with a real, live actuary?

Gaze up at the government benches behind you, Prime Minister.

There's a guy named Paul McCrossan who has done such a yeoman's job as an ordinary MP that he keeps making a couple of your ministers (read: Tom Hockin and Harve Andre) look wanting with a flick of his intellect.

Financial institutions reform, credit-card interest rates, tax reform, bank service charges. Name the issue. Prime Minister, and you'll discover that McCrossan's constructive thumb print is all over it as a leading light on the House of Commons finance committee.

Besides, Brian, given your record, not to mention that of your illustrious cabinet, wouldn't it be nice to have someone trained in the science of calculating risks sitting around the table?

Yes, Prime Minister, that's what an actuary does for a living."
– Jonathan Ferguson in the *Toronto Star*, June 4

Isn't it time we had some principles?

by R. Stephen Radcliffe

The Society Board has reaffirmed its desire to adopt actuarial principles as statements of opinion by forming a new Committee on Actuarial Principles, with Arnold Dicke as Chairperson. If the Casualty Actuarial Society Board agrees, this will be a Joint Committee.

The Committee will begin work immediately to identify and articulate principles to be recommended to the Boards for adoption in 1989. The Committee, which will be kept small to be most efficient, needs many consultants to review its findings and writings as the principles are developed. Anyone interested in serving as a consultant may call Steve Radcliffe or Arnold Dicke.

Writing principles is a very difficult task. There is always a great danger of wandering about the philosophical landscape without coming to a successful conclusion of defining a useful principle. The result is often either a controversial statement or a motherhood statement that nobody can disagree with.

A set of well-articulated principles would define the scope of our profession and provide an inventory of the problem-solving skills and tools available to actuaries. Consistent and well-organized principles will also provide a precise and common language, reducing the confusion created when actuaries from different backgrounds use different notation and terminology for the same basic ideas.

Principles will provide a good foundation for standards. The people who write standards would like to point to a higher authority so that the standards will be well grounded. Also, during the discussion stage of articulating the principles, many important issues are identified, debated and clarified. This often difficult and tortuous exercise helps focus on the true identity of the actuary and the actuarial profession. There are three different types of principles to be considered (examples are provided with respect to the time value of money principle).

1. Basic Principles
These fundamental, basic truths or axioms underlie the entire structure of actuarial science. They describe the organization of observed facts that represent the operation of general laws. (For example, the value of money changes over time and is a function of the force of interest.)

2. Methodology Principles (Techniques)
These describe the rules of calculation which implement the basic principles under a set of given conditions. They represent techniques that reflect the "state of the art" at a given time. (For example, the value of money at time 0 is defined by the equation,
$$S_0 = S_t \cdot e^{-\int_0^t \delta_s \cdot ds}.)$$

3. Behavioral Principles (Standards of Practice)
These moral and ethical codes for behavior are better defined as standards of practice and, from this point on, will be referred to as standards instead of principles. (For example, when making an actuarial calculation, one should consider the principle of the time value of money. If the time value is material to the calculation, an appropriate assumption for the force of interest should be used.)

Because the confusion between standards and principles has stymied past attempts to articulate principles, a distinction must be drawn between them. Then the learned bodies, the SOA and the CAS, should develop principles, and the Actuarial Standards Board should develop standards. The standards, when properly stated, will refer back to the principles. In other respects, a firm line should be drawn between principles and standards of practice. The principles, especially the methodology principles, define what the actuary is capable of doing. Standards define what the actuary should do in light of what he or she is capable of doing.

Perhaps the organization of principles and standards can be better understood by describing some of their characteristics:

1. The basic principles will hardly ever change over time. However, methodology principles and especially standards of practice will change over time.

2. The basic and methodology principles are apersonal; they do not involve a person's judgment. Standards of practice, by definition, always involve a person. The choice of which methodologies to use is a matter of judgment, and these choices should be controlled by standards.

3. Discipline should apply only to standards. Principles should be isolated from any discipline procedures of the profession. Some worry that strict adherence to principles or otherwise accepted doctrine could inhibit research. On the contrary, well-structured principles should encourage research. If our actuarial knowledge is organized through a structure of principles, it will actually be easier to extend knowledge through research.

Developing and articulating principles is an important priority for the Society. It could define our very reason for being and serve as the foundation for strategic planning. It is difficult to determine an accurate course for the future of the actuary without first building a firm foundation for take-off. It is in this spirit that we should encourage this endeavor, no matter how difficult it may be. It may take a long time, but it is crucial to develop the backbone of our profession in these critical and changing times.

R. Stephen Radcliffe is Senior Vice President and Chief Actuary, American United Life Insurance Company. He is the Society Vice President in charge of Committees on Actuarial Principles and Valuation and the Committees on Career Development.

Thank you, Graham Deas

In the June *Actuary* we mistakenly implied that Charlie Groeschell, our Competition Editor, is the creator of both the Actucrosswords and the Actucrostics. While Charlie performs valuable services in his editorial capacity and as author of the Actucrostics, the Actucrosswords have been created by R. Graham Deas, ASA, FFA. More about Graham will appear in a future issue of *The Actuary*.

In Memoriam

Harvey H. Conklin FSA 1958
Thomas K. Dodd FSA 1925
Maurice H. Farrant FSA 1952
David H. Miles ASA 1986
Harry D. Morgan FSA 1959
Thomas J. Norris FSA 1975

About the U.S. Census Bureau

by John G. Keane

While many people are familiar with the U.S. Census Bureau's Decennial Census, fewer people know about the other vast amounts of data that the Census Bureau collects and disseminates. Following are highlights of what the Census Bureau has to offer in the other nine years.

Current Demographic Data
If you need demographic data more current than our Decennial Census data, turn to our current surveys. Here are some of them:

• The Current Population Survey supports monthly estimates of employment, unemployment, and labor force characteristics. Supplemental data gathered in most months cover a wide range of characteristics relating to poverty, family income, displaced workers, noncash benefits, immigration, adult education, school enrollment, immunization, fertility, child support, voting, etc.

• The American Housing Survey, conducted every two years, offers statistics comparable to those of the census, such as year structure built, number of living quarters, property value, kitchen and plumbing facilities, and type of heating. Other data reflect neighborhood and housing quality, more detailed financial characteristics, and energy-related items.

• The Survey of Income and Program Participation provides continuous information on national household economic well-being and the characteristics of persons participating in such government programs as food stamps and Aid to Families with Dependent Children.

Other demographic surveys include Consumer Expenditure Survey, National Crime Survey, health-related surveys, and housing-related surveys.

Economic Censuses
The Census Bureau conducts censuses and current surveys of most U.S. businesses. Censuses of the economy (currently underway and conducted every five years) provide complete and reliable information on virtually every major economic sector, including retail trade, wholesale trade, service industries, manufacturers, mineral, construction, transportation, agriculture, and government. Special programs include the Surveys of Minority and Women-Owned Businesses, company-wide statistics, and irrigation practices.

Censuses data are encyclopedic, covering more than 12,000 different products and providing information for geographic areas as small as 2,500 persons. The censuses are crucial to maintaining the system of Gross National Product accounts and accurately "benchmarking" the country's economic performance. They also provide information needed to plan state and local economic development, assess individual business performance, and identify new product markets.

Current Economic Data
More than 100 annual, quarterly and monthly surveys carry forward key national economic statistics on a current basis. Examples include the Annual Survey of Manufacturers; the annual and monthly retail, wholesale, and services surveys; and the Quarterly Financial Report. Monthly surveys cover residential and commercial construction. We also produce annual reports of federal expenditures in each state and local area.

Our merchandise trade data program provides the closely watched trade deficit number each month and gives details on the commodities the U.S. exports and imports. These data are based on import and export documents (about 15 million a year!) provided by the U.S. Customs Service.

International Work
The Census Bureau has trained over 10,000 foreign professionals and has provided technical advisors in host countries. Its one-of-a-kind data bank contains demographic, economic, and social data for over 200 countries. Given the global competitiveness issue, this data bank has enormous potential.

Assistance
Our data are released in varied forms — publications, tape files, floppy diskettes, maps, microfiche, and our CENDATA, an electronic transmission service. To help you work through this mountain of data, we publish reference guides and maintain sources of assistance. To get started, just call our Customer Services representatives in Suitland, Maryland (301-763-4100). They'll direct you to technical experts at headquarters or information specialists located in one of our 12 regional offices. They can also help you purchase reports, computer tapes, other data products, and reference materials.

John G. Keane, Ph.D., not a member of the Society, is Director, Bureau of the Census, U.S. Department of Commerce.

Life expectancy study welcomes actuarial participation

Actuaries having responsibility for valuing large blocks of annuity business will be interested in a project getting under way at the University of Minnesota.

The project is under the direction of Dr. James Vaupel, noted demographer at the Hubert Humphrey Institute and Director of the Center for Population Analysis and Policy. Vaupel has assembled an interdisciplinary seminar of faculty members consisting of demographers, anthropologists, biologists, geneticists, medical doctors, sociologists, economists, and an actuary.

The project's purpose is to determine the likelihood and the consequences of extending human life expectancy to 100 years and beyond. J. Stanley Hill, FSA, is the Principal Investigator for the part of the project to study the effect of this extension on life insurance companies and the Social Security system. Two major companies have already agreed to participate in this study, and a few more will be selected.

It appears that this project is unique. Hill has notified us of it for two reasons:

1. To determine whether projects of a similar nature might be under way elsewhere.

2. To invite inquiries from appropriate actuaries concerning possible participation in the project.

Readers are welcome to call Hill at 612-426-2508 or write to him at 5011 Lake Avenue #205, White Bear Lake, MN 55110.

Life insurance sales illustrations — What are the problems?

by Charles E. Ritzke

The emerging life insurance sales illustration crisis has been receiving more attention every day from actuaries, regulators, industry watchdogs, and others. Proposed regulatory measures seem not to address the problems directly. This article is an effort to provoke discussion and ideas which directly address these problems.

The problems involve more than just the use of unrealistic interest rates. There are many ways to enhance sales illustrations. Let us first describe a product of a hypothetical company that does not contemplate any product "enhancements." This universal life product is currently receiving 8% interest and has cost-of-insurance rates equal to 60% of 1965-70 ultimate mortality (for a male nonsmoker age 45). A 5% load is deducted from each premium, and a fee of $5 per month is deducted from the account value. There are no other front-end charges. The product has reasonably competitive surrender charges and produces a reasonable (but not excessive) expected profit margin under aggressive, but reasonable, current pricing assumptions. The company's illustrations reflect the above-described product features.

Now let us look at a few enhanced illustrations:

(a) The illustration is like the first, except that the company illustrates no 5% load or $5 fee after year 15.

(b) The illustration is like the first but uses mortality that improves 2% per year, with the company correspondingly reducing c.o.i. rates starting in years 16, 21, 26, etc. (i.e., by 30%, 10%, 10%, etc.).

(c) The illustration is like the first but includes a bonus in year 16 equal to all the charges deducted during the first 15 years and a bonus in year 26 equal to all charges deducted in years 16 to 25.

(d) The illustration is like the first but includes a 1/2-point interest bonus in years 16, 21, 26, etc., all calculated retroactive to year 1.

(e) The illustration is like the first but includes a 25% annual premium bonus in years 16 and beyond.

(f) The illustration incorporates all the above enhancements.

The table below summarizes the illustrated cash values on each basis for a level $100,000 death benefit (except for corridors) and an annual premium of $1,200.

Illustration	Illustrated Cash Value	
	Year 20	Year 30
Unenhanced	$32,451	$ 69,900
(a)	33,227	74,187
(b)	34,059	81,260
(c)	45,292	118,584
(d)	34,968	107,127
(e)	34,430	80,846
(f)	52,174	171,521

There are, no doubt, many other methods of proposal enhancement not described here. The Microsoft Quickbasic program listing that was used to generate these values will be made available to anyone wishing to contribute additional examples. In any case, here are some questions and comments based on the above examples:

(1) Are some or all of these methods of proposal enhancement inappropriate?

(2) Are they always wrong, or is the problem just the degree to which they are used?

(3) If they are sometimes all right, what criteria should be used to determine when they are all right?

(4) How will the various proposals intended to address these problems deal with each of the examples cited? For example, will cost disclosure proposals eliminate or identify inappropriate enhancements? How should annual statement interrogatories be answered for each of these companies, and what is the intended result of these answers? Will proposed nonforfeiture laws address these examples?

(5) The above illustrations do not differ during the first 15 years of the policy, and they differ by fairly small amounts over 20 years. Using common methods for determining profitability (20-year profit studies discounted heavily by interest and survivorship), any of these illustrations could probably be justified on the basis of expected profits at issue under reasonable and customary assumptions. Of course, the actuary repricing these blocks of business 15 years from now may have a more difficult time justifying the enhanced factors when they are scheduled to actually happen.

(6) There is a proposal that companies not be allowed to illustrate other than their "current" scales unless appropriate "disclosure" is provided. There are two potential problems with this proposal. First, what constitutes a "current" scale? Must a company illustrate a cost-of-insurance rate (or interest rate or expense charge) in year 20 for issue age 45 equal to the rate for a 65-year-old in year 1? Can companies sell different contracts to policyholders in different issue year/age brackets to circumvent these rules? Second, disclosure of these practices would not have a significant effect. How often have consumers actually reviewed, questioned, or made decisions based on the reams of cost disclosure numbers that we currently supply? Most consumers will believe any projection generated by the computer with the apparent blessing of the company, regardless of what the fine print says.

(7) Many companies that use these "enhancement" methods claim that they are all right because they guarantee their enhancements. However, how meaningful are these guarantees? For example, what does it mean to guarantee an interest-rate spread above the then-current rate offered on new contracts? Guaranteeing 50 points higher than another number that itself is not guaranteed is in fact hardly any guarantee at all. In general, unless all the factors in the product have well-defined guarantees, any so-called guaranteed enhancements can probably be offset by changes in other factors.

(8) If long-term guaranteed enhancements are in fact real and substantial guarantees, then should regulators and our nonforfeiture laws allow these extreme "tontine-like" policies to be sold? Clearly, the historical intent of nonforfeiture laws was to require immediate cash surrender values that reflect the value of future guaranteed benefits. Even if these "enhancements" are not guaranteed, should nonforfei-

Life insurance sales cont'd

ture laws not somehow address these "tontine-like" future projections?

A few other related issues are not reflected in the hypothetical sales illustrations described above:

(9) A few years ago there were complaints about 40-year cash value illustrations that used new-money interest rates. Rates were at a peak, and new-money rates were much higher than the portfolio rates reflected in some companies' dividend scales. It was contended that new-money rates would eventually come down much faster than portfolio rates would and that the new-money illustrations were much less likely to be realized. Lately, however, the shoe is on the other foot. Portfolio-rate dividend illustrations are tough to beat with a realistic new-money product. Are these comparisons not at least as misleading as they were a few years ago?

(10) Why do disclosure laws not apply to participating policies in the same way they apply to universal life? For instance, it should be required that the annual expense load equal to the difference between the gross premium and net cash value premium be prominently disclosed as the guaranteed expense charge. The "tontine" effect in universal life policies pales in comparison to what can be done with participating policies that do not disclose the factors underlying their guarantees and dividend scales.

There probably are no perfect solutions to these problems. Firmer actions are needed, however, to keep these practices in check. Very specific and strict rules as to what can be legally shown in a sales illustration, along with more enlightened regulation of product designs, are an absolute necessity in order to contend with these problems.

Charles E. Ritzke is Vice President and Chief Actuary at Zurich American Life Insurance Company. He is responsible for product development, marketing and sales support, and financial reporting.

TSA paper accepted

The following paper has been accepted for publication in TSA Volume 40: "Recent Mortality Experience in the Soviet Union," by Robert J. Myers.

ARIA promotes interaction of academics, industry

by Curtis E. Huntington

Many SOA members are members of The American Risk and Insurance Association (ARIA). However, many others are either unaware of ARIA's existence or uninformed about its activities. As Society Liaison to ARIA, I feel the two organizations will benefit from a more active interchange.

ARIA President Michael Murray shares that view. The following information is adapted from material he supplied. One of ARIA's goals is to increase interaction between academics and the insurance industry. An aspect of this goal is to increase the number of Institutional Sponsors of ARIA. Members interested in this sponsorship may contact Dr. Murray at The Insurance Center, Drake University, Des Moines, Iowa 50311.

I. Origin and Current Makeup of ARIA

Founded as the American Association of University Teachers of Insurance in the 1930s, the organization changed its name in the 1960s to reflect that membership interests span not only the institutional response to risk, but the nature of risk itself. It also reflected, to some extent, a desire to lend greater academic credibility to the subject area.

ARIA comprises 352 academic members and 465 general (i.e., industry) members. It has 15 institutional sponsors. There are 776 subscribers to the *Journal of Risk and Insurance.* ARIA's annual budget is approximately $100,000, of which some 40% is used to print the *Journal.*

Recent members of the Board of Directors have represented academic institutions, industry associations (e.g., Risk and Insurance Management Society, National Association of Independent Insurers, Life Office Management Association and Insurance Institute of America) and a number of individual insurance companies.

II. Background on Industry Interaction

Increasingly, academic members are recognizing that ties to the insurance industry are a significant source of purpose for ARIA. While ARIA continues to resist any efforts to enlist its support for any particular industry

view, it nonetheless recognizes the tremendous contribution of the insurance device and industry to our society and encourages general industry support for its activities. There is increasing recognition that the schism between theoretical research and practical applications needs to be bridged. Industry leaders are becoming better attuned to the need to incorporate newer theories into their daily operations. In addition, academics are increasingly sensitive to the need for students to have a sound institutional background.

III. Benefits for the Insurance Industry
A. General Support for University Insurance Education

There is a widespread concern today for the future of insurance education at our institutions of higher learning. One school of thought holds that insurance is a field of study too specialized for undergraduate business students. Another is concerned that the course studied is more "training" than "education." ARIA members generally feel that insurance professors provide a valuable learning experience, one that should be retained in the university curriculum. The Association makes an effort to support that view.

B. Specific Support for Risk Management as a Core Subject

ARIA has, in recent years, spearheaded a drive to have the American Association of Collegiate Schools of Business require that risk management be included within the core of compulsory subjects at accredited institutions.

C. Encouragement of Research in Risk and Insurance

Through the *Journal of Risk and Insurance* and through its annual meetings, ARIA provides an outlet for research related to risk and insurance. Efforts to make this basic research more attractive to industry are occurring on two fronts. First, as the quantitative techniques are refined, their benefit becomes more apparent. For example, techniques which first appeared in the *Journal* are now written about in publications like *Risk Management* magazine. Second, a

ARIA promotes cont'd

growing segment of the ARIA membership is increasingly committed to
i) requiring that even quantitative articles be written in a manner which facilitates understanding and
ii) devoting a larger proportion of the *Journal* to nonquantitative topics.

D. Support for Book Awards
Each year, ARIA selects two of the best books on insurance or related matters published in the previous year and presents cash awards to their authors at the annual meeting. The purpose is to encourage high quality publications about insurance.

E. Specific Assistance to University Insurance Professors
Two recent annual meeting sessions have been designed to improve the quality of insurance teaching. The first was an annual seminar on pedagogical techniques sponsored by the Insurance Information Institute. It provided a forum for leading educators to assist members with their teaching techniques. The second is the recently instituted Pedagogical Seminar. In this seminar, leading scholars in insurance and related disciplines present summaries of cutting edge topics related to the teaching of insurance. The intent is to encourage and assist professors to incorporate these topics into their classes.

F. Encouragement of Academic/ Industry Interaction
Industry leaders are encouraged to attend ARIA meetings; in some instances, personal invitations are sent to officers of industry associations and they are accorded special guest status. In addition, ARIA provides funding for its president to accept invitations to industry association meetings.

In an effort to increase communication between the two organizations, SOA staffed a round-table discussion of current research issues at ARIA's annual meeting August 14-17 in Reno.

Curtis E. Huntington is Corporate Actuary with New England Mutual Life Insurance Company, Boston. A past General Chairperson of the E&E Committee, he is now a member of the Education Policy Committee, the Research Policy Committee and the Board of Governors.

Executive Committee and Board of Governors report of significant actions

by Anthony T. Spano

Executive Committee – March 8-9, 1988 – Phoenix
For the second ballot of the Society's 1988 elections, the Committee approved a classification of candidates and continuing Board members by area of practice. Included as areas of practice would be such categories as insurance company, insurance consultant, pension consultant, health consultant, and teaching. The objective is to achieve appropriate representation from each major segment of the membership on both the Board and the Executive Committee.

Board of Governors – May 18, 1988 – Louisville
The Board accepted the final report of the Task Force to Revitalize Society Research. In accordance with Task Force recommendations and as part of additional efforts to strengthen significantly the role of research within the Society, the Board:
• Approved creation of a Research Development Fund to accept donations and grants to be used for initiating and developing research activities and programs approved by the Board.
• Approved provision of $25,000 for specific worthwhile research projects identified by the Research Policy Committee, to be made available for expenditure on the approval of the Executive Committee.

The Board authorized the appointment of a joint committee with the Casualty Actuarial Society to articulate actuarial principles. It also received the final report of the Committee on Life Insurance Company Valuation Principles, authorized that the report be made available to the Society membership upon request, directed the Committee to turn its report over to the new Actuarial Principles Committee for its consideration, and discharged the Committee with thanks.

Anthony T. Spano is Actuary, American Council of Life Insurance. He is Secretary of the SOA.

A means of comparing unit reserves on different valuation bases

by Henry R. Ramsey, Jr.

The heightened interest and concern with respect to statutory valuation bases and the increasing emphasis on effective-management-basis financial statements have resulted in a greater need for a means to compare different reserve bases. Formula B in Table 1 enables a duration-by-duration comparison of the components of the calculation of two different valuation bases (one designated by primed values, the other by unprimed values).

(*Ed. note: The 14-step derivation of the formula, not printed here, can be obtained from the author at his Yearbook address. The derivation makes use of, among others, formula A [see Table 1].*

The author explains that this is general formula, expressed in a form suitable for use with reserves on a "level-return-on-equity" [level ROE] basis. A paper describing the level ROE reserve basis was distributed to Financial Reporting Section members in February 1987).

The Generalized Comparison Formula
The generalized comparison formula (formula B – see Table 1) assumes that the unprimed reserves ignore taxes and do not take into account that the company may require a return on its invested assets that differs from the expected investment earnings rate. Thus, unprimed reserve bases could include statutory and GAAP valuation bases as currently defined.

This formula says that the difference in reserves at a given duration (using "new" for primed values and "old" for unprimed values) is equal to the present value at the new valuation rate of the following at each future duration:
(a) the excess of the new valuation rate over the new interest rate times the new asset value at the beginning of the year
minus (b) the excess of the new valua-

A means of comparing cont'd

tion rate over the old valuation rate times the old reserve value at the beginning of the year

minus (c) the excess of the new insurance cash flow for the year over the old cash flow for the year

plus (d) the provision for taxes for the year.

Definitions

Σ = sum for all positive integral
j   values of j

r = the valuation interest rate

v_r = $1/(1 + r)$

i = the annual pretax investment earnings rate assumed in the valuation

A_j = the amount of interest-earning assets assumed in the valuation for duration j; e.g., total investment earnings assumed for the year divided by i

Δ_j = insurance cash flow received during year j, defined as all cash flow assumed to be received in the valuation other than investment earnings and taxes

m = zero for stock companies and the "differential earnings rate" as defined in the current federal income tax law for mutual companies

T = the marginal tax rate applicable to earned income over the future life of the contract

z' = $[r' + m \cdot (1 + r'/2)] \cdot T/(1 - T)$

$^{T}V_j$ = the tax-basis pretax net-contract-liability at duration j.

This formula assumes that the reserve includes all asset and liability items related to the contract other than any deferred tax liability reserve; therefore, it is net of such items as due and unreported premiums and deferred acquisition cost and includes any provision for policyholder dividends. It is assumed that a deferred tax liability will be established in an amount equal to:

$T \cdot (^{T}V_t - V_t)$.

Some Comparison Examples

First, let's look at a comparison of a "level ROE" reserve basis to a stock GAAP reserve basis. In the initial look, let's assume that taxes are equal to zero, that the product was priced to produce a return on capital equal to the pretax investment earnings rate, and that both valuations use the same margins for adverse deviation. In the formula, the final term related to taxes drops out, and since r' = i' = r, the first two terms drop out. That leaves us with the difference in insurance cash flow. Since the values of these two reserves should be zero at issue, the insurance cash flow on the ROE basis must be the same as on the GAAP basis. This in turn means that when the level percentage-of-premium profit was calculated for the GAAP basis, it would have turned out to be zero. Thus, a company that prices to return the level ROE equal to the gross investment earnings rate will find that its level percentage-of-premium profit amount is zero and that the proper rate of return will be generated from the financial statement except for tax considerations.

Let's now look at the same situation except that taxes are recognized in calculating the expected return on capital in pricing. In this case, there will be a percentage-of-premium profit factor in the GAAP calculation, and its present value at issue must be equal to the present value of the tax burden shown as the last item in the formula. In considering the incidence of the differences in reserves, it would appear likely that the level ROE reserves will be somewhat higher than the stock GAAP reserves because the quantity in parenthesis in the tax item, when expressed on a per-thousand insurance-in-force basis, is generally sloped upward by duration as compared to the percentage-of-premium factor being constant.

An additional question that might be asked is what level ROE after taxes will result if the percent-of-premium profit provision in the GAAP formula is zero. The answer is that the level ROE rate will be equal to the net-after-tax earnings rate on investments, since the durational factor in the formula reduces to $(r' - i' + z')$ $(A' - {}^{T}V)$. Since the present value of this quantity must be zero at issue, this means that r' must equal i' - z', and examination of that result gives the answer indicated.

To do a proper "level ROE" valuation, including the recognition of taxes, it is necessary to be sure that the values of i and Δ are on a fully-taxable-equivalent basis. This means that the interest rates on tax-favored investments need to be adjusted accordingly, and the difference in marginal tax rates on some of the insurance cash flow components should be recognized in order to give a fully adjusted result. For a mutual company, this would mean increasing policyholder dividends significantly in order to recognize the additional tax cost that is associated with the dividend treatment in the federal income tax law.

Note that the formula tax provision includes a portion of the "surplus tax" incurred in the year prior to the valuation, and some offset provision is necessary to avoid double counting. This can be accomplished by reducing the reserve (V_t) by:

$$\frac{[m \cdot T/2 \cdot ({}^{t}A_t - {}^{T}V_t)]}{(1 - T)}.$$

Henry B. Ramsey, Jr., is a retired Vice President of The Penn Mutual Life Insurance Company. He has been actively involved in accounting and related matters in both professional and industry circles and was for several years on the Council of the SOA Life Insurance Company Financial Reporting Section.

TABLE 1

Formula A

$$V'_t = A'_t - \sum_j v'^j_r \cdot [A'_{t+j-1}(1 + i') + \Delta'_{t+j} - z' \cdot (A'_{t+j-1} - {}^{T}V'_{t+j-1}) - A'_{t+j}]$$

Formula B

$$V'_t = V_t + \sum_j v'^j_r \cdot [(r' - i') \cdot A'_{j+t-1} - (r' - r) \cdot V_{j+t-1} - (\Delta'_{j+t} - \Delta_{j+t}) + z' \cdot (A'_{j+t-1} - {}^{T}V_{j+t-1})]$$

Dear Editor:

Blessed obscurity

The ranking of "actuary" as the best job by *The Jobs Rated Almanac* sheds history's first light on us mathematical Morlocks. For decades we've labored deep in the candle-lit bowels of insurance companies or sweated unnoticed in the bullpens of benefits consulting firms. Indeed, prior to *The Jobs Rated Almanac* exposure, the only thing that had gained actuaries fame was our obscurity.

I hope this publicity doesn't bring hordes of pubescent MBAs sporting laptop computers into our obscure midst. Those of us who sharpened our actuarial incisors on wooden slide rules deserve to serve our remaining days in protected sinecures. Lower the starting salaries! Raise the professional standards! Don't let the actuary become like the BMW! Keep us obscure!

Frank D. Repp, Jr.

More about Joe Glenn

News of the death of Joseph B. Glenn caused me to reflect on the study of the military retirement system in which I was involved from October of 1958 to July of 1959. Under Joe's direction a crew of five actuarial students (all that could be found on active duty at that time) and a few clerks all ably assisted by Friden calculators ground out 16 multiple-decrement tables which were used to project costs for the military retirement system. I can't recall the period of projection, but do know that we were projecting costs for eventual retirees who were yet to enter active duty. Joe's uncanny ability to apply the smell test to every aspect of the work amazed us all.

At the time I was not entirely sure I wanted to pursue an actuarial career and turned to him for advice. He suggested that I not go forward unless absolutely sure because the actuarial field is only for those who are totally committed. Fortunately, commitment finally set in, and Joe was certainly right in his advice.

Raymond A. Bierschbach

Worry more about those taxes!

What with all the misinformation around regarding the tax status of pension plans, at least *The Actuary* should be deserving of trust. In the February issue reference was made to

a surtax on annual payouts in excess of $200,000. Of course, the surtax applies to amounts in excess of $112,500 (indexed) or $150,000 (not indexed), while $200,000 is the maximum annual compensation that may be considered.

James B. Germain

Strong reservations

Recently, I have been trying to follow the progress of nonforfeiture value and reserve regulation. This has been fairly unpleasant because progress is very slow and it appears that the new regulations are likely to be worse than the old for complication and variation by type of policy. The regulation now is horribly complicated and difficult to interpret.

Since the approach for annuities is relatively simple and easy to apply, how about using it for a model? To adapt the approach to life cash values, revise the limit on loads and throw in a maximum mortality charge. The argument against this approach based on price regulation is hollow. First, health and annuities are already price-regulated. Second, if price regulation really is a barrier, allow unlimited level renewal loads. Life reserves could be subject to similar limits with some sort of deficiency reserve thrown in. The retrospective approach has many advantages: it's simple, adaptable to all life policies, and easy to revise in the future without major theoretical changes.

If you are tired of jumping through increasingly difficult hoops invented by FASB, NAIC, and Congress, get involved in the issues on the side of rational simplicity.

Doug Hawley

Single-premium life taxation

On May 13, 1988, three U.S. life insurance associations submitted to Congress a proposal for the taxation of single-premium life products. The proposal would establish a new class of life insurance policies called "modified endowments." These would be policies which satisfy the definition of life insurance (Section 7702 of the Tax Code) but fail a proposed 5-pay test. Modified endowments would enjoy tax-free death benefits and tax-deferred cash value build-up. However, any premature distribution from the cash value, as either a loan or a withdrawal, would be taxed heavily. The House Committee on Ways and Means is currently addressing the proposal,

but with a 7-pay, instead of a 5-pay, test.

I am opposed to the creation of a "modified endowment" category of life insurance policies. I think there are better ways to address the single-premium issue. My reasons are:

1. Section 7702 is so horrendous already that the ACLI is currently expending considerable resources trying to interpret a law that's about four years old. Adding this new category of policies to the existing tax law will make the policyholder tax law so complex that it may be completely unworkable from a practical standpoint.

2. This approach will potentially be very expensive for some companies to implement and administer. From a practical standpoint, this additional cost will be wasted because by design a modified endowment won't be a very marketable product. If I'm wrong and modified endowments can be marketed in significant amounts, it will mean the modified endowment approach didn't work, and the law will certainly be changed.

3. Companies will still be able to sell single-premium products qualifying as life insurance and paying competitive interest rates. This fact will be enough to convince some people that the modified endowment approach isn't working. This matter may be vigorously reconsidered in 1989 by people who strongly believe the Committee on Ways and Means approach didn't go far enough in addressing the problem.

4. The 7-year pay period sticks out like a sore thumb as something that can be further lengthened if it is perceived that the rules are too lenient. During the deliberations by the Committee, the pay period jumped between 5 and 20 years before settling at 7 years. A pay period significantly longer than seven years will take a good deal of legitimate universal life business down the river along with single premium business. There is a good chance that the modified endowment approach will ultimately lead to major limitations on the sale of universal life, if the people who don't think the approach is working try to remedy this by increasing the pay period.

As an alternative to the concept of creating the modified endowment category of policies, I suggest that a

Dear Editor cont'd

better, cleaner approach to the problem is to modify Section 7702 directly. I've seen several suggestions using this approach. As an example, consider the idea of adding the 7-pay rule directly in the definition of life insurance. The disadvantage of this suggestion, compared to the modified endowment proposal, is that all "modified endowments" would now fail the definition of life insurance in Section 7702. I don't see this as a major disadvantage, because the distribution rules under the Ways and Means approach greatly limit the marketability of modified endowments (while still leaving a "loophole" in the view of some opponents); hence, the additional burden of failing Section 7702 wouldn't hurt much more.

A big advantage of adding a 7-pay rule to the definition of life insurance, compared to the modified endowment proposal, is that Section 7702 wouldn't be any more unworkable or any more expensive to administer than it already is. Also, since single-premium policies couldn't be sold as life insurance, there would be less grounds to argue that the new approach didn't solve the problem. I urge actuaries to consider the approach of directly modifying the definition of life insurance, because I think it represents the best opportunity to continue enjoying the marketing success that companies have had with universal life products.

David S. Lee

Does it pass the tests?

Gary Simms (May 1988 Actuary) rightly states that the actuarial profession needs to consider the lessons learned by others in relation to continuing professional education (CPE). Unfortunately, he tells us only what some have done, not what they have learned.

Two questions need to be answered affirmatively about the majority of existing programs in other professions before considering a formalized program for the actuarial profession. These questions are:

• Has the formalization of the program improved overall professional performance compared to that under an informal program?

• Is the program cost-effective in achieving this improvement?

One clear way in which any profession could answer the first question would be by analysis of the incidence and outcome of malpractice suits or of complaints about professional misconduct before and after the introduction of the formalized program. For those professions in which the formalization has been required in some states but not others (e.g., the American Medical Association's program – which Simms curiously fails to mention), a useful analysis can be done by making comparisons both over time and among professionals in states with and without required formalized programs. If formalization showed a significant reduction in complaints or malpractice suits (with unfavorable outcomes), then the first question would have been answered "yes."

The second question could be answered by assigning costs in a way similar to that used by the joint task force that considered the proposal for mandatory CPE for enrolled actuaries. These costs could then be compared to the benefits resulting from reduced malpractice awards. Even then it could be argued that it is for the malpractice insurers to establish their own criteria of CPE needed by an acceptable risk, based on their own experience.

Finally, I would be interested to find out what lessons were learned by the British accounting profession which, I understand, had a formalized CPE system for some time and then abolished it!

Jan Harrington

Be all you can be

While it represents a vast improvement over what it used to be, the Society of Actuaries' The Actuary still falls short of its potential.

As a communication tool, The Actuary communicates too little. It ought to help replace and eliminate that endless stream of "junk mail" emanating from the Society. The Society wastes time, money, and effort sending numerous mailings containing separate announcements about special seminars, future meetings, available books and cassettes, TSA paper abstracts, etc., virtually all of which could be forwarded in the form of quasi-ads in The Actuary.

The Actuary could, for instance, disseminate the Society's examination pass lists, providing a more permanent record of these lists. The Actuary could provide virtually all election information (except ballots).

The Actuary could do more. It could help prevent the balkanization of the profession through overspecialization by providing each Society section with a "department" for articles and other information. In this way, the works of each section would be available to all actuaries, not just those who have joined a particular section. The Actuary also could have regular as well as guest columns. And what would be wrong with thought-provoking editorials?

The Actuary could provide more information on the work of the Society board and committees. It could publish advance information (date, time, place, agenda) on the meetings of the more important committees, so that invitations to attend as observers would be more sincere and not be reserved (for all practical purposes) for those few in the know. In that way, The Actuary could help further democratize the Society. Interesting highlights from the minutes of these meetings also could be published afterwards.

As to format, it should be observed that The Actuary carries yet no pictures (but an associate editor's) and no graphics. It handicaps its growth and development, and reduces its usefulness too, by not carrying advertisements (except for free ads, thinly disguised as announcements, for a few select providers of actuarial books and seminars and for academic employers of actuaries).

The Society has far too long overlooked the power of communication, and its unifying potential for a small profession scattered across the continent and with increasingly varied interests. Much as I hate to say it, The Actuary is 10% of what it should be and could be. It is not unattractive, and it is relatively interesting. But it does not fill the role that it could and that it should. It is too short and too modest in its scope, reach, and ambition.

This said, it would be unfair, I think, to overlook the obvious improvements which have been made under the current Editor's leadership, perhaps under constraints (in budget, personnel and time) which make her efforts that much more meritorious. I hope the Society membership, through its board, will rally behind the idea of making communications within the profession a tool for the profession's

Dear Editor cont'd

unification and growth. For all the present efforts and work, I express my own sincere thanks.

Claude Y. Paquin

More on health insurance reserves

Bill Buchanan's article, "Health Insurance Reserves Controversy," in the June *Actuary* needs a response. Bill attributes the roots of the controversy surrounding the "Benefit Ratio Reserve (BRR) Method" to the concept itself, alleging that it involves a "confusion of reserve adequacy with policyholder equity."

The method has nothing to do with "policyholder equity." Bill presents very little case for his contention, but such case as he does make appears to rely on the unfounded notion that a BRR reserve determination is merely an "accumulated total of premiums over claims," using valuation net premiums calculated as a "planned percentage" of the gross premiums. His choice of words here appears equivalent to the notion of a "guaranteed" loss ratio return to policyholders; hence his conclusion that "policyholder equity" is the key consideration. We have heard this argument before, and it has been refuted before (with no return counter-rebuttal, I might add).

The loss ratios (R values) employed in BRR reserve computation are *prospective* contract lifetime estimates, based on *expected* cumulative experience, subject to periodic correction as emerging experience indicates – a fact which previous exposure drafts of the proposed BRR method have made abundantly clear. The objective is to forecast the eventual *actual* (not "planned" – not "target" – not "guaranteed") lifetime ratio of the value of benefits to the value of gross premiums. This may prove to be less than, or more than, the original anticipated ratio. No concept of any "planned" or "guaranteed" ratio implying policyholder equity is involved.

Nor is the existence of rate regulation any necessary assumption underlying the method. The method would be just as appropriate – just as practical – just as valid, if rate regulation were nonexistent. The method does, however, allow for (in fact, *requires*) consideration of *any and all* significant factors that might have an impact on the excess of future claims over future premiums.

Among these factors, in addition to "inflation, changes in medical practice, and the ability (or restriction) of the company to change premium rates," as mentioned by Bill, is "limitations which may be imposed upon future rate increases by state regulation," also mentioned by Bill. Yet Bill somehow, after acknowledging that regulatory limitations should be "recognized" in estimating future premiums, suggests that this is "separate and apart from the solvency 'reserve' element." Why? It could well prove to be one of the more significant factors affecting the adequacy of future premiums. But this point is secondary: the BRR method was designed to take ready account of any and all factors affecting future premiums and claims under health insurance coverages prone to cost trends and to the likelihood of future premium adjustments.

Bill dismisses as an "algebraic manipulation" what is in fact one more simple demonstration of the mathematical identity between a reserve on a defined basis calculated by retrospective formula with a reserve on the same defined basis calculated by prospective formula. This is an elementary actuarial equivalence: Bill himself acknowledges that this is a fact that "all actuarial students learn." Yet he appears not to believe it. I suggest that he disprove my demonstration of the identity, rather than attempt to dismiss it as mere "manipulation."

As the preferred approach, he recommends an "objective tabular standard"; that is, a traditional reserve basis, completely defined in terms of morbidity, decrement and interest values. He then seeks to justify the prospective efficacy of such a locked-in basis by proposing that only the prospective formula be used to calculate the values; even though, here too, a retrospective formula produces the identical result, "as all actuarial students learn."

In attacking the validity of the BRR method, he informs us that "only in that rare (or probably even nonexistent) case where the experience (net premium) is the planned percentage of the gross premium, is the retrospective reserve fund accumulation equal [to] the prospective reserve for health insurance."

Quite true. But it is not equally true that "only in that rare (or probably nonexistent) case, where the valuation

net premium is calculated on fixed assumptions as to morbidity, decrement and interest, all of which later prove to match subsequent experience, will the reserve (whether actually calculated retrospectively or prospectively) be that amount which, together with anticipated future premiums, is exactly sufficient to meet future claims"?

The real issue here is a practical one. Which method lends itself more readily to later correction as emerging reality departs from the original assumptions? The BRR reserve can be corrected by correcting the R value (or series of values) periodically, as indicated by emerging experience. Satisfactory periodic correction of all morbidity, decrement and even interest values underlying Bill's "objective tabular standard" is a more complex matter.

Under either reserve method, varying degrees of gross premium valuation testing will surely be required, and these ultimate tests have been provided for under the BRR proposal, the same as under Bill's preferred alternative. But his recommended method, dependent as it is on extensive and detailed arrays of specific assumptions as to morbidity, decrement rates and interest rates, needs far more "buttressing" by careful gross premium projection and valuation than does the BRR method.

Paul Barnhart

Northeastern University actuarial alumni reunion

In conjunction with the Society's annual meeting in Boston, there will be a reception for alumni of the Graduate School of Actuarial Science at Northeastern University.

The reception will be held from 7:30 to 10:30 p.m. on Sunday, October 23, at the Marriott Copley Place Hotel. A light buffet and cash bar will be available.

The reception will be hosted by Dean Geoffrey Crofts and other members of the actuarial faculty. Reservations are not required.
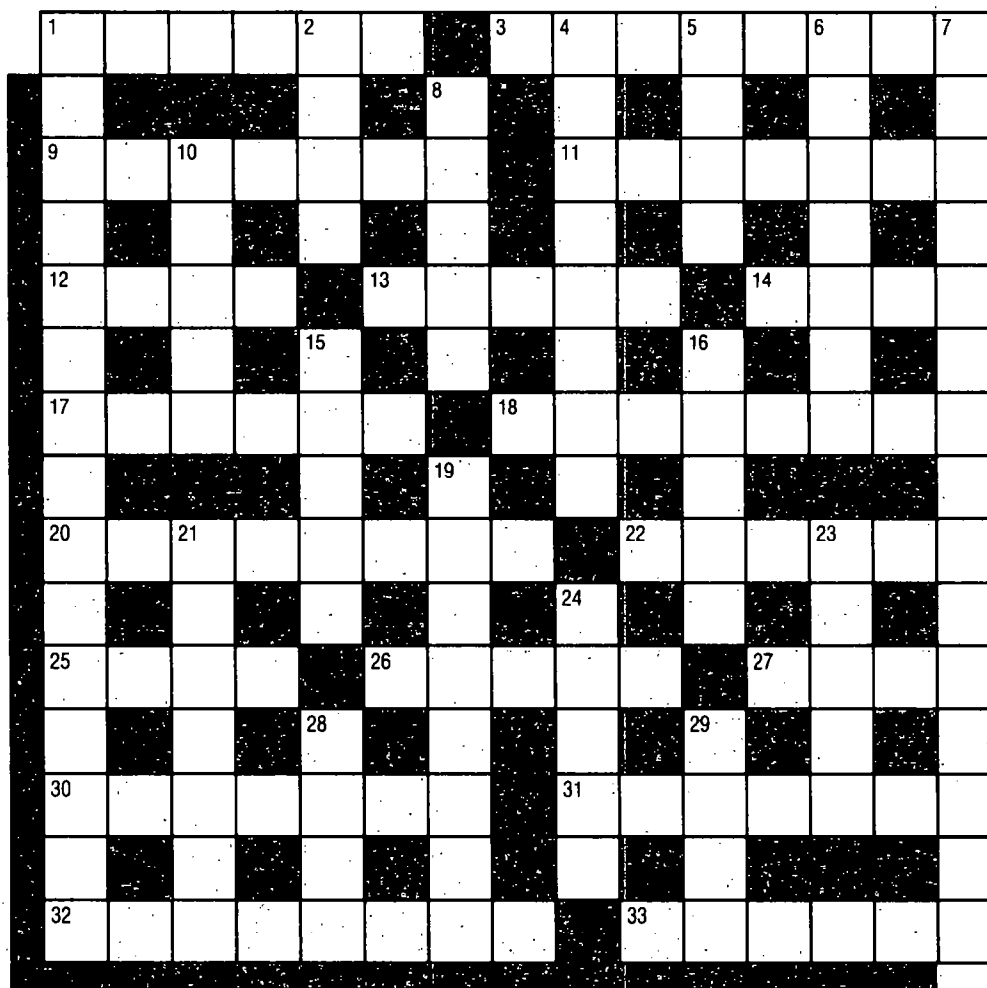
ACTUCROSSWORD

Across

1. One quarter of America (3,3)
3. Officer generous with employees (8)
9. Own volition renders us naked (7)
11. English river on a state capital (7)
12. It is promising when females lack direction (4)
13. Therefore be right, not tight (5)
14. Unfair 17s of show business (4)
17. Relatively qualified to dress 16s (6)
18. Greek letter in minor position: half man, half bull (8)
20. Jumpy time for Olympics (4,4)
22. Old Europeans where lines meet fishes (6)
25. Ancient city of the French language (4)
26. Phantoms but of solid foundation (5)
27. Clothes that become 30 with age (4)
30. What shrub can make with a little bismuth (7)
31. Good golf also changes form of coverage (7)
32. One can't hope for such a memorial (8)
33. They could be logs of particular shape (6)

Down

1. Artist of low standing (8,7)
2. How black things look in state of South (4)
4. How daring to tip diner out (8)
5. Send Zeus back to Africa (4)
6. Anti-aircraft gun- it is a resort in the West Indies (7)
7. Imagine 27, 33, for special entertainment (5,5,5)
8. Silly do with only one in it (5)
10. States vice versa (5)
15. Some chicken yards in the country (5)
16. It's cut and curled (5)
19. Ironclad difficulty (8)
21. Here's to the and of the good French ornithologist (7)
23. In order to get sound opening moves (5)
24. Inclination of Oslo pedagogue (5)
28. Inclination of sound Hungarian musician (4)
29. Rural, but of the present day, it is said (4)

July's Solution

M	A	K	I	N	G	A	F	A	S	T	B	U	C	K
I			E	S		N		R		N		I		
S	C	R	A	W	L	S		S	P	E	C	I	A	L
A			P		O		W		A		O			O
P	R	O	N	O	U	N	C	E		D	E	N	I	M
P		S		R		A		R		L				E
R	O	T	A	T	I	N	G		D	E	S	P	O	T
E		I			T		D			L		R		
E		A		C	S		I		T		C			
H	E	A	R	T	S		M	I	S	S	O	U	R	I
N	A	B	O	B		L	E	C	H	E	R	O	U	S
S		E	U		E		I		S					C
I	N	S	U	L	A	R		P	E	T	U	N	I	A
O		E		A		I		L		A				L
N	U	T	C	R	A	C	K	E	R	S	U	I	T	E

Send solutions to: Competition Editor, 8620 N. Port Washington Rd (312), Milwaukee, WI 53217

ACTUCROSTIC

A. Four beats per measure. (2 wds)
57 106 118 18 224 138 71 183 36 86

B. Be patient; roll with the punches. (4 wds)
99 152 23 104 236 41 95 219
7 74 141 190 55 15 123

C. Spirit of renewed religious interest.
16 223 45 122 83 177 64 199 235 161

D. Characteristic of accessible computer data.
35 176 28 150 77 125 197
140 101 8 239

E. Aristocracy; the Four Hundred. (2 wds)
189 60 171 103 145 81 174 40 206 126

F. So be it; you bet! (2 wds)
6 182 49 168 154 33 113 214 89

G. Arrogant mood or manner. (2 wds)
13 79 160 66 228 107 90 29 175

H. Become closely associated. (2 wds)
9 200 34 158 92 179 54 215 72
109 151 139 222

I. Evangelist; crusader.
4 111 80 184 124 70 234 58 94 191

J. This Mary is quite contrary.
30 167 216 50 69 17 117 39

K. Simple; easy as pie.
2 108 209 43 85 221 217 202 20 129

L. Bugs Bunny's home, perhaps. (2 wds)
3 100 149 231 73 205
155 61 166 112 192

M. One with tousled, strawlike hair.
12 128 68 115 226 218 47

N. Having a tendency to kill another.
22 146 53 201 136 116 78 173 208

O. Standing out; famous.
14 96 204 159 46 165 181

P. Where prosperity was during the 1930's. (4 wds)
195 38 10 134 229 98 162 91 157 240
21 110 65 185 31 212 142 52 120

Q. Repeatedly. (3 wds)
25 76 186 105 193 147 87
137 238 172 225

R. Well known US western park
93 233 102 59 135 24
42 220 82 187 164

S. Forbidden; taboo. (2 wds)
37 143 153 237 56 130 19 198 178

T. Palmed off; imposed upon.
1 127 156 32 114 67 203

U. Restrained from normal expression.
163 196 63 62 133 207 230

V. Merge into a single body or mixture.
5 227 131 44 121 169 213 97 188 84

W. Qualified; moderated.
11 211 48 170 148 26 232 194

X. This is better than none. (3 wds)
51 119 27 180 75 132 144 88 210

1 T	2 K	3 L	4 I	5 V	6 F	7 B		8 D	9 H	10 P	11 W		12 M	13 G	14 O	15 B	16 C	17 J	18 A		19 S	20 K
21 P	22 N	23 B		24 R	25 Q	26 W	27 X	28 D	29 G		30 J	31 P	32 T	33 F		34 H	35 D	36 A	37 S	38 P	39 J		40 E
41 B	42 R	43 K	44 V	45 C	46 O	47 M		48 W	49 F	50 J	51 X	52 P	53 N	54 H	55 B	56 S	57 A	58 I	59 R		60 E	61 L	62 U
63 U	64 C	65 P		66 G	67 T		68 M	69 J	70 I	71 A	72 H		73 L		74 B	75 X	76 Q	77 D		78 N	79 G	80 I	81 E
82 R	83 C	84 V	85 K	86 A	87 Q		88 X		89 F	90 G	91 P	92 H	93 R		94 I	95 B	96 O	97 V	98 P	99 B	100 L	101 D	102 R
103 E		104 B	105 Q	106 A	107 G	108 K		109 H	110 P	111 I	112 L	113 F		114 T	115 M	116 N	117 J		118 A	119 X	120 P	121 V	122 C
123 B		124 I	125 D		126 E	127 T	128 M		129 K	130 S	131 V	132 X	133 U		134 P	135 R		136 N	137 Q	138 A	139 H	140 D	141 B
142 P		143 S	144 X	145 E		146 N	147 Q	148 W		149 L	150 D	151 H	152 B	153 S		154 F	155 L	156 T	157 P	158 H	159 O	160 G
161 C	162 P	163 U	164 R	165 O	166 L		167 J	168 F		169 V	170 W	171 E	172 Q	173 N	174 E	175 O	176 O		177 C	178 S		179 H	180 X
	181 O	182 F	183 A	184 I		185 P	186 Q	187 R	188 V	189 E	190 B	191 I		192 L	193 Q	194 W		195 P	196 U	197 D	198 S	199 C	200 H
201 N	202 K	203 T		204 O	205 L	206 E	207 U	208 N	209 K		210 X	211 W	212 P	213 V	214 F	215 H	216 J		217 K	218 M	219 B	220 R
221 K	222 H	223 C	224 A	225 Q	226 M	227 V		228 G	229 P	230 U		231 L	232 W	233 R	234 I		235 C	236 B	237 S	238 Q	239 O	240 P

LAST MONTH'S SOLUTION: (Judith) Stone, The Joke of Silicon Valley, "But it's Saint Silicon . . . warning folks to watch for the signs of PCness envy—the fear that the other guy's system packs more RAM than yours, but ending with the words that restoreth the scroll: 'There's no need to abandon hope, all ye who press Enter; in the end everything will be right justified.'" DISCOVER, December, 1987.