



SOCIETY OF ACTUARIES

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ACTUARIAL BLUEPRINT

by E. J. Moorhead

This newsletter's nominee for the most spectacular American at last summer's International Congress is Prof. William S. Jewell of the University of California, Berkeley, who, as Mr. Hazelcorn reports in this issue, introduced the Congress subject, *Generalized Models of the Insurance Business*. Prof. Jewell describes himself as "a physicist-engineer-operations researcher who has not had extensive actuarial practice," but who, inter alia, teaches life contingencies to engineering and statistics students.

Following a pattern of ideas put forward by his colleague, Prof. Thomas S. Kuhn, in *The Structure of Scientific Revolutions* (a 1970 paperback available in libraries), Prof. Jewell delivered pointed criticism of actuaries who stick to outmoded ways of thinking when conditions demand new approaches. He introduced his paper thus:

Every scientific community reveals its shared beliefs and values . . . and its current state-of-the-art and evolutionary future, through its model-building activity and its scientific communications. To survey the field of actuarial science, one must examine, classify and comment upon the basic paradigms—the accepted concepts-models-puzzles-solutions—that are revealed in the literature of risk and insurance theory.

Examine, classify and comment, Prof. Jewell, in an exciting 45-minute speech, assuredly did. He began by saying that in any scientific community the accepted mode of thought and description is hard to displace, even when some new element such as hyper-inflation or changed living habits begins to contradict the assumptions we have embraced. Says Prof. Jewell:

At first, the reaction to these crises is simply increased activity within the old paradigm, as attempts are made . . . to patch up those methods and models which worked so well in the past. . . . But at some point, the difficulty will not be able to be set right by the traditional processes. . . . Many divergent partial solutions will be attempted. . . . Corporate management, regulators and legislators will also try to resolve matters directly through

their powers, rather than waiting for the community to resolve the anomaly. . . . Then finally occurs what Kuhn calls a scientific revolution—appearance of a competing paradigm which begins to accumulate a weight of evidence and coherence and to attract an increasing number of disciples and camp-followers. . . . Some practitioners are forever resistant, because lifelong productive careers and reputations commit them to an older tradition . . . And often, the arguments which are most convincing in favor of the new paradigm are not easily explained in the old terminology.

No more than the thrust can be conveyed here of a remarkable lecture in which, by the way, the speaker asserts that (a) there's a mismatch between capabilities of today's students and the demands placed upon them by our profession's traditional expected-value models, and (b) the actuary is burdened with an archaic notation system "which is the subject of continued, rather pointless, discussion." The Society would do well to make Prof. Jewell's 98-page paper available to all members willing to study it, and to have it explained and discussed at our 1981 spring meetings.

Among the ringing words with which the paper closes are these:

Receptiveness to new ideas is critical. . . , and it is delightful to see that it is often the senior statesmen of insurance who are actively trying out and promoting new ideas. . . . More research support is needed. . . . I hope to see ARCH grow into a national research journal encouraging contributions from other scientists interested in insurance modeling. . . . There must be continuing evolution of the educational process. . . .

I urge you all to continue to be receptive of and tolerant towards new methods, models, and paradigms, analyzing and testing them, not through reaction, but in terms of their potential utility to the actuarial community and the insurance enterprise. . . . The evolution of the '80's will, I believe, make it an exciting and challenging decade for insurance modelling, and I look forward to participating in it with you. (emphasis added) □

FOR THE INFLATION SICKNESS

by E. J. Moorhead

"Differential Inflation," says Elmer R. Benedict, "denotes the distortion of income relationships among members of the population resulting from the combination of price inflation and 'wage' or, more generally, 'income' inflation."

Mr. Benedict has devoted several years of his retirement to studying the scourge of inflation, and has written a yet unpublished manuscript that sets forth a plan for relieving the unfair impact that price inflation exerts upon those who aren't fully or substantially protected by the offsetting income inflation.

His underlying theme is that the best national hope for bringing our dollar's value back to reasonable stability would come from making sure that everybody, not just the retired, shares in the losses that inflation causes. He emphasizes, appropriately enough, that the price rises that everybody complains about are a genuine disaster for but a minority, a nuisance for many others, and even a source of personal advantage for some. While this anomaly continues, it is useless to hope that an aroused electorate will demand that the federal authorities take remedial action.

Mr. Benedict's book, *Protecting Retirement Against Inflation*, presents a broad program for equitable sharing of the inflation burden. Its kingpin is an income adjustment designed to restore the purchasing power of the otherwise ravaged incomes of retired and disabled persons and surviving widow(er)s.

The plan calls for use of the federal income tax system as a redistributing mechanism. The taxpayer would declare, in Form 1040, the loss he or she had suffered from the rise in the cost of living, treating it just as if it were a tax that he or she had already paid. That same amount would be declared as income for the year. Thus the Benedict adjustment would work just as if the government had mailed the taxpayer a check for his or her cost-of-living reparation, its amount constituting both taxable income and tax already paid. The size of this inflation protection would be identical to that now provided to civil service and armed forces pensioners (Titles 5 and 10 of the U.S. Code).

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Inflation Sickness

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An example given is that of a man who retired ten years ago on a yearly fixed income of \$8,000. For him, the income tax due under present rules might be \$329. But under the plan he would declare a cost-of-living adjustment of \$7,120, raising his gross income to \$15,120, on which the computed tax would be \$2,293. Since \$7,120 would be considered already paid, he would claim a tax refund of \$4,827.

This method, says its designer, would have salutary effect on Congressional and Executive Branch dedication to inflation fighting, as they see inflation recycled right back through the system that created it.

Actuaries, even those among us who are completely or substantially protected from the ravages of inflation, have as our professional mission the designing of trustworthy security instruments for the public. Surely we ought to examine selflessly a plan such as this one, and to announce our verdict on whether it would be effective in enabling the unwritten promises of private pensions to be realized by their participants. □

WAGGISH KILBOURNE

Ed. Note: This was contributed to the newspaper of the 1980 International Congress by Frederick W. Kilbourne.

Congress Echo wishes to recognize those papers that were regretfully rejected, namely:

—a paper that tested the hypothesis that male mortality exceeds female because men are slowly strangled by their neckties;

—an application of generally accepted statistical standards to observations of Zurich driving habits, proving conclusively that all Zurich drivers have been killed in auto accidents and the cars seen on city streets are proceeding of their own free will;

—developing the theoretical foundation for volcano insurance to be sold in the U.S.A. (paper withdrawn; revised version in process);

—an original actuarial opera, entirely in actuarial notation, based on a tragic triangle whose points were a young actuarial student, her instructor, and her supervisor. □

FEDERAL STATISTICS

Copies of the following may be had for prices shown, from Superintendent of Documents, U.S. Govt. Printing Office, Washington, DC 20402:

Money Income in 1978 of Households in the United States, P-60, No. 121, \$4.25.

Changes during the 1970's in median and per capita income are analyzed by the Census Bureau and related to changing household composition, race, ethnic origin, etc. The report also looks at changes in real income adjusted for inflation.

Marital Status and Living Arrangements, P-20, No. 349, \$3.75.

During the 1970's young adults waited longer than formerly before marrying, says this Census Bureau report of a 1979 nationwide survey. It also shows the extent to which young women are not marrying or are delaying marriage. About 1.3 million households were shared by two unrelated adults of opposite sexes in 1979, more than twice the 1970 number. □

VOLUMES YOU MIGHT DONATE

Our headquarters library in Chicago would welcome donations of the following volumes and numbers of the *Transactions of the Society of Actuaries*:

Bound volumes I, II, IV, IX, XIII, XXVI.

Paperbacks, nos. 31, 74, 75, 76.

On the theory that beggars can be choosers, it is asked that such items be in excellent condition unmarred by scribblings and that donors assume shipping costs. In return, a donor will receive an acknowledgment letter stating the gift's value to support a charitable deduction.

Thanks To Our Algebraists

Our May issue had an appeal for help with a problem pestering the Part 3 Examination Committee.

The 36 repliers lined up thus:

Favoring Proposed Definition I	12
Favoring Proposed Definition II	20
Raised Eyebrows	4
	36

Messrs. Lowrie and Dicke will tell us more in a later issue. □

BOOK REVIEW

Peter G. Moore, *Reason By Numbers*, 406 pp., Pelican Books 1980, paperback \$5.95.

by E. J. Moorhead

This is an imaginatively organized and well-written text. We can be pleased that its author is an actuary.

Peter G. Moore, F.I.A., is Deputy Principal and Professor of Statistics and Operational Research at the London Business School. He is active in the affairs of the Institute of Actuaries, currently a member of its Council.

Unless one delves into this paperback, one might be forgiven for dismissing its jacket message as exaggerated:

“Guesswork, however inspired, is no substitute for a sound working knowledge of probability, sampling, decision analysis, risk profiles—in a word, for numeracy. In this Pelican, Peter Moore looks at the ways of gathering, presenting and interpreting information and explains the essential arithmetic of resource allocation, planning and decision theory.”

But the book fully lives up to its blurb. The author succeeds, with few words wasted, in conveying the essence of these concepts and applications. He has furnished many practical examples (some whimsical), and has rounded out each of his fifteen chapters with exercises, solutions to which are given.

To convey an idea of this book's scope, one need only list some chapter titles, viz.,

- Chap. 1. Beginners, Please
- 3. Algorithms
- 6. Mathematics For Planning
- 8. Statistical Interpretation
- 9. Probability — Fact or Fiction?
- 13. Decision Analysis
- 14. Simulation and Risk Profile

Written for “those working in business or commerce at any level of managerial or supervisory responsibility,” this is a book from which many an actuary, including this reviewer, can learn, and one that an actuary can confidently present or recommend to anybody who hasn't yet been faced with, or is a fugitive from, business mathematics. □