SOCIETY OF ACTUARIES

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Centennial cont'd

Finally, a challenge that seems especially appropriate to address in our centennial year is to make sure all our members – no matter what their field of activity or country of residence – feel represented in the leadership of the Society and that the Society is responsive to their needs. Our meetings and seminars have increasingly recognized the needs of pension and health actuaries. That has been a positive trend and must be continued. Now we need to find ways to make sure that non-company and non-life insurance actuaries have full and complete involvement on the Society Board and Executive Committee. The result will be better decisions and programs even more responsive to the needs of all members.

The year 1989 will be exciting for all actuaries. We will properly and enthusiastically honor our heritage while working on a diversity of issues that should make our future even brighter.

Ian M. Rolland, SOA President for 1988-89, is President, Lincoln National Corporation.

New retirement history survey proposed for U.S.

Comments are welcome on a National Institute on Aging proposal for a periodic survey to obtain needed data on retirement, health, and economics among retirement-age persons (ranging from as young as 50 or 55 on up). This U.S.-government survey would revive and expand the Retirement History Survey, which was conducted every two years from 1969 to 1979. The planning is directed by Dr. Richard Suzman, Behavioral Science Research Office, National Institute on Aging, Building 31, Room 5C32, Bethesda, MD 20205.

At the September 9 meeting of the Council of Professional Associations on Federal Statistics (COPAFS), Dr. Suzman said that comments on the proposed survey would be considered if received by him within a few months. Some background information on the subject, received through COPAFS, may be obtained from Daniel F. Case at his *Yearbook* address or phone number.

Expert explains expert systems

Features Editor Deborah Poppel spoke with Stephen F. Siegel, Director of Knowledge Engineering at Applied Intelligence Systems, Inc. (AIS). AIS is a New York City-based vendor of expert systems, predominantly in Life Insurance Underwriting. Dr. Siegel has a Ph.D. in Experimental Psychology from Brown University.

***Poppel:** What is an expert system?*
Siegel: An expert system is a computer program that processes information at a level equal to or near that of human experts. It consists of a set of rules, also called the knowledge base, and a computer program to process the rules, also called an inference engine.

***Poppel:** Are the terms "Expert Systems" and "Artificial Intelligence" (AI) interchangeable?*
Siegel: No; expert systems are a susbset of AI, which is the study of how computers can simulate functions of the human mind. Other subsets are robotics, machine vision, machine learning, and natural language understanding. The piece of AI that's the most viable in business right now is expert system technology.

***Poppel:** Who builds expert systems?*
Siegel: A knowledge engineer builds them. This differs from a programmer, who generally works from a well-defined set of specifications. For a knowledge engineer, the biggest challenge may actually be determining the specifications.

***Poppel:** How does someone become a knowledge engineer?*
Siegel: You can't go to school for it, at least not yet. Knowledge engineers are often former programmers. However, as expert systems become more sophisticated, it's becoming more important for knowledge engineers to have an understanding of human cognition – how people think.

***Poppel:** How is an expert system different from a conventional system?*
Siegel: Some people don't think they're different. For me, as a psychologist, the difference is that an expert system is trying to emulate a human problem-solving process. Some people's definition is that it's written in a particular AI language.

One key difference is that the expert system's rules live separately from the rest of the system. An advantage of designing a system this way is that instead of having a long period of defining specifications, you can build the system and change it later, more quickly and efficiently than you can change a conventional system.

***Poppel:** Can you give an example?*
Siegel: Let's say you have a system for underwriting life insurance. It may have a rule that says, "If the proposed insured participates in a dangerous avocation, refer the case to an underwriter." That's a very simple, yes-no rule, which might be sufficient for a first-cut system. If you want to make the system smarter, you can build more choices into the yes answers – "If the avocation is skydiving, how many hours?" You can keep adding possible outcomes, or nodes, to the decision tree.

***Poppel:** Other differences?*
Siegel: Another difference is that our systems are built primarily by the experts, rather than the knowledge engineers and programmers alone. Since the rules don't have to be explained to systems analysts, who in turn explain them to programmers, who then translate them into computer code, you avoid losing something in the translation, and the end product is more likely to do what you want it to.

Normally, you build computer systems to do things involving a lot of computation that people aren't very good at. These systems are algorithmic – they use an explicit set of instructions for calculating solutions. Expert systems are heuristic – they use rules of thumb, which means they will be right most of the time, but not necessarily all the time, sort of like human experts. You might say that in conventional systems, the computer is told how to solve the problem. In expert systems, the computer is told what the problem is, but not how to solve it.

***Poppel:** What's the hardest part of developing an expert system?*
Siegel: The hardest part is coming up with the rules. In many cases they're

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