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# The Actuary

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## CALCULATORS ENTER THE EXAM ROOM

The E & E Committee has announced that, beginning in May 1984, calculators will be permitted for all Society examinations. Rules have been promulgated for all exams, except Part 7-P (US), rules for which will be distributed with the tickets of admission.

Use of calculators will be optional. The Part Committees will not change their examination emphasis or the types of questions; the same fundamentals as in the past will be stressed.

The announcement to candidates sets forth the names and model numbers of the only calculators that will be permitted in 1984. Candidates may bring extra batteries and one back-up calculator; only one calculator may be used at one time.

## QUALIFYING TO PRACTICE IN THE UNITED KINGDOM

The following message, of interest to Society Fellows who may wish to practice in the U.K., has come to our President from Mr. C. S. S. Lyon, President of the Institute of Actuaries:

When an overseas insurance company is transacting long-term business in the UK, our regulatory authority, the Department of Trade and Industry (DTI), requires certain statutory returns to be signed by an actuary appointed by the company, i.e., the Appointed Actuary. If the company wishes to appoint for this purpose an actuary who is not a Fellow of the Institute or Faculty, the DTI, with the advice of the Government Actuary, has to decide whether or not he is acceptable.

The criteria for this decision relate both to the nature of the applicant's actuarial qualification and to the extent of his relevant experience. The DTI considers it essential that a person becoming an Appointed Actuary have available the guidance given by the Institute and Faculty to FIAs and FFAs, that he carry out his duties with due regard to such guidance, and

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## DIRECTORY OF ACTUARIAL TRAINING PROGRAMS

In May 1983, the Society office circulated members who are chief actuaries inviting their contributions to a booklet for students that would acquaint them with existing actuarial training programs, full-time or summer and internships. The result was "Actuarial Training Programs, 1983", a copy of which is available from Itasca headquarters. The numbers of such programs in this first edition were:

Canada	17
U.S.A.—East	38
U.S.A.—Midwest	41
U.S.A.—South	32
U.S.A.—West	11
Overseas	5
	144

Immediately upon publication, a survey for the second edition was launched. Our guess is that many who missed being in the first booklet will make the second.

## BLENDED 1980 CSO TABLES FOR "NORRIS"

by Robert J. Johansen, Chairman,  
Mortality Problems Committee

In response to an NAIC request, our newly renamed committee (see below—Ed.) has prepared two sets of blended-by-sex 1980 CSO mortality tables for use in determining minimum cash values and nonforfeiture benefits for life insurance policies issued in employee benefit plans which, because of the Norris decision, must provide equal annual benefits to men and women.

An NAIC resolution adopted last fall permitted use of blended tables but did not specify any tables nor a method to construct them; at its December meeting, NAIC adopted 20%, 40%, 50%, 60% and 80% male blended tables iden-

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## THE FUTURE—AS THROUGH A GLASS DARKLY

by James C. Hickman

Actuaries and social scientists gazed into their collective crystal ball at the Actuarial Research Conference at University of Wisconsin-Madison, September 29th to October 1st, 1983. They were trying to foresee the implications of population trends on social insurance and employee benefit programs.

The conference, on "Population Projections: Techniques and Implications", was co-sponsored by the Society's Research and Social Insurance Committees and the School of Business, University of Wisconsin.

The far-reaching trends cited were: increasing life expectancy, decreasing birth rate, an aging population and workforce, growing numbers of working women, impending revolution in office work, a declining tax base, and escalating social and benefit program costs

## Keyfitz Analysis

In his keynote address, "Technology, Employment and the Succession of Generations", Nathan Keyfitz, Harvard University, recalled that formerly a person trained in some skill could expect to live out his or her working life in the exercise of that skill. "Technical change", said he, "was manageable. Only at retirement would substantial change be made as a youthful successor replaced him (or her) on the job. The rhythm of change was thus in harmony with the succession of generations." This is no longer true.

Keyfitz explained that "the disharmony that results when the pace of technical advance greatly exceeds the pace of turnover of generations is accentuated by the fall in birth rate". Because the birth rate fell 30-40 percent, starting in about 1960, the number of entrants into the labor force in most Western countries is now

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## The Future

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falling. "With rapid technical change we move from a condition in which experience is an asset to the community, the employer, and the individual who has acquired it, to a condition in which experience is a handicap. This problem is part of the much larger issue of work and employment in the twentieth century", the demographer said.

And life expectancy has increased by over three years during the 1970s to nearly 75 years; it was 65 years as recently as 1940. Aging of the labor force comes, though, primarily from the falling fertility rate. The average number of children a woman could be expected to bear, about 3.7 in the late 1950s, is now just under 1.9, less than the 2.2 children that a population requires to replace itself, so only immigration can keep the population from declining. Families may for economic reasons be choosing not to have children, but part of the long-term reason is that women are seeking their own independent careers. Only those who foresee a retreat from women's liberation, with family strengthened and divorce rare, can consistently forecast a substantial rise in births. "I am not one to make such a forecast", Keyfitz remarked.

The demographer went on to say that, even under these influences, our economy has shown a surprising ability to make jobs, even during the last decade of recession.

Would machines displace people? No, Keyfitz and other participants agreed, even though machines create disturbances by temporarily displacing workers, they provide income for somebody; this means profits or pay for those on the job, money in customers' hands, and potential for hiring people to service the machines. "Technological unemployment is therefore only an illusion; it doesn't really exist", he said, conceding that a worker's adaptability to temporary displacement would be crucial.

His solution to employee displacement would be a combination of retraining and stimulus to new enterprise that would employ the people involved. "I am not", said he, "the first to say that it is the enterpriser who may well be the key to the entire problem."

## STUDY MANUALS FOR PARTS 2 & 4

Solutions to the 100 questions in the Nov. 1981 & May 1982 Part 2 exams, prepared by Dr. Ralph Garfield (see Yearbook) are available for \$18.00. A Part 4 manual containing 120 questions and solutions based on the new syllabus costs \$30.00. For orders or information, write to Actuarial Study Materials, Box 522, Merrick, NY 11566.

### Myers' View

Robert J. Myers echoed Keyfitz' observations about demographic changes and applied them to the future of Social Security, emphasizing the importance of looking at population changes as a key to long term planning. "With Social Security, the benefit structure and the structure of the covered population determine the cost", he said. But the fertility rate, the most important planning factor, is also the most difficult to predict. Other key factors in Social Security planning are net immigration (which will continue to increase if the fertility rate stays low), the benefit provisions themselves, the health and work ability of the people, the state of the economy, and the retirement age of the workforce.

Myers said that if legislation had not been enacted in 1983, this would have been a decade of severe financial crisis for the system. Many have predicted that the demographic picture will make the 1990s a golden age for Social Security, but Myers has his doubts since demographic changes move slowly and the economy fluctuates rapidly.

### Other Contributions

David R. McKusick, reporting on work done with Roland E. King and Solomon Mussey, described the prospective impact of demographic change on publicly funded medical insurance costs. Taking only population change into consideration, Medicare plus Medicaid costs as percentages of payroll, 5.14% in 1980, are projected to be 9.46% in 2040.

In a session on methodology of population projections, John Long, U.S. Census Bureau, reviewed four projecting traditions—judgmental, time series, demographic accounting, and explanatory. Papers by William Bell, Census Bureau, and Richard Johnson and Robert Miller, both University of Wisconsin, covered time analysis methods, use of transformations in analyzing demographic data and use of time series analysis following

## Practice in U.K.

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that in the event of his failure to do so he be subject to professional discipline similar to that applying to FIAs and FFAs.

With that object in view, the DTI is imposing a condition that an actuary with an overseas qualification who is not already a member of the Institute or Faculty must obtain admission to Affiliate Membership of the Institute. A similar condition is being imposed by the government-sponsored Occupational Pensions Board in respect of actuarial certificates required by the Board on the funding position of a pension scheme whose members are contracted out of the earnings-related pension benefits of the National Insurance Scheme.

Affiliate Membership, for which the subscription is now at the same level as our Student Members (entrance fee £20, annual subscription £44 in the latest Institute Year Book—Ed.), does not permit use of any designatory letters but provides some of the Institute facilities. Applications for Affiliate Membership from Fellows of the Society are accepted fairly automatically if they have the support of two Fellows of the Institute of Actuaries.

Mr. Lyon's letter goes on to discuss what should be done when an applicant is insufficiently acquainted with Institute Fellows to obtain the needed pair of supporting signatures. Applicants faced with this difficulty despite the existence of numerous FIAs on this continent, should take this up with our Secretary at his Yearbook location.

transformations in forecasting age-specific birth rates.

The effect of the "baby boom" followed by the "baby bust" on employee benefit plans was explored by Ben W. Lutek, and by Lep Hansen and Karen Holden, both of University of Wisconsin. Robert L. Brown gave a broader perspective of those events, suggesting also that recent economic swings may have been amplified by inappropriate monetary and fiscal responses to events that had been caused by demographic changes.

John A. Beekman outlined aspects of mathematical demography that are directly relevant to actuarial science. Phelim P. Boyle, University of Waterloo, combined the Lotka continuous population dynamics model with the Easterlin observation that women born in large cohorts tend to produce fewer children than those born in small cohorts. The result was a simple model that produces population waves and fertility fluctuations.

An issue of ARCH will be devoted to the Conference papers and discussions.