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SOME THOUGHTS ON POPULATION AFTER A TRIP TO INDIA

by Frederic Seltzer

Marble palaces inlaid with precious jewels shimmering in the moonlight, sparkling fountains playing in Moghul gardens, crumbling forts commanding forgotten cities, soaring temple towers carved with myriad aspects of strange gods, ephemeral visions on dusty desert roads, the eternal Buddha of frosty mountain slopes . . . .

Much of the countryside was stripped of trees and erosion was much in evidence. A long drought in some areas and a cyclone in others had driven people from their homes to find food and water in already overcrowded cities, where power and water supplies were sometimes rationed or entirely cut off. People slept in the streets or in shanties amid new skyscrapers thrusting up to often polluted skies. Attractive figures painted on signs promoting family planning looked down upon a multitude of naked children playing in squalid surroundings. Recent gains in public health and reductions in mortality had increased the population to over 550 million, but the quality of life seemed little different from that of my last visit to India in 1965.

Populations growing, spiraling out of control. Cities unable to cope—to provide housing and employment, clean water and air. As I walked city streets and drove through rural villages my thoughts returned to the United States. Is the American future to be found somewhere in the confusion assailing my senses? Many of our cities are crowded and lack necessary housing and some have already experienced water and power shortages. In addition, *Current Population Reports P-25 No.* 470 of the Bureau of the Census has forecast a

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INSTITUTE OF ACTUARIES

The Institute of Actuaries celebrated its centenary in 1948 and on that occasion E. M. McConney presented to the Institute, on behalf of the Actuarial Society of America and the American Institute of Actuaries, a silver pitcher and tray. The presentation is recorded with an accompanying photograph on pages 14 and 15 of *Volume* 1 of the *Proceedings of the Centenary Assembly*. The Institute reports that the pitcher and tray have been useful as well as ornamental and have been used at sessional meetings and other appropriate occasions.

Unfortunately, in August 1971, there was a burglary at Staple Inn during which the pitcher and tray were stolen together with several other gifts of silver. The Board of Governors decided to replace the gift and this was transported to England by President Bowles and presented to the Institute when Mr. Bowles attended the meeting where Geoffrey Heywood gave his presidential address. The gift was suitably acknowledged by Mr. Heywood.

The Society is glad to restore this form of insurance against possible excessive dryness at Institute discussions.

SEMINAR STUDY MANUAL

Richard L. London F.S.A., and Steven B. Russ A.S.A., *Study Manual for the Society of Actuaries Examination Part* 7, Graduate School of Actuarial Science, Northeastern University, Boston, pp. 209. $12.50.

by Linden N. Cole

Students returning to their companies after experiencing "total immersion" in an actuarial seminar at Northeastern University have been enthusiastic about the value of the seminars to them. Now the staff at Northeastern has decided to share the study materials with the actuarial world, and has published a series

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TOMORROW'S ACTUARY

by Tim Giles

At the Dec. 14 meeting of the Baltimore Actuaries Club, I reported on a seminar for actuaries held by IBM at Poughkeepsie, N. Y. on Nov. 13-15. Presentations were made by IBM personnel on storage devices, terminals, virtual storage, virtual memory, multiprogramming, new programming languages (BASIC and APL), and the valuation modules (ALIS and CFO II). Presentations were also made by actuaries on how they were using these new techniques: corporate modelling, pension proposals, pension valuations, and ratebook revisions.

The main inference drawn from the seminar was that actuaries can now program without suffering the drawbacks of FORTRAN: the core limitations, key punching, turn-around time, decimal placement, output arrangement, etc. The new languages use a typewriter, are in commonly understood notation and plain English, and handle basic decisions like decimal placement on an exception basis. The new equipment enables many people to program at the same time and offers direct access to policy record files.

Creativity will surely be enhanced by this new opportunity to converse directly with the computer without waiting to get a test run returned. We will be less timid to pursue questions that occur in mid-project. The weary frustration marking the attitude of today's actuary toward computers will be overcome by new students entering the profession from colleges that have terminals available for homework assignments.

Besides doing mortality and lapse studies directly from a terminal in the actuarial department we can look forward to greater computational facility. Claim distributions can be calculated di-

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LETTERS

From Mr. Trowbridge

Sir:

I would appreciate the courtesy of your columns to announce that I am intending to leave government service in the relatively near future, and that the position of Chief Actuary, Social Security Administration, will become open. I wish to assure the actuarial world that my reasons are entirely personal rather than professional; and are not related to recent developments in Social Security financing or recent personnel changes within the Department of Health, Education, and Welfare.

The Social Security system has become so large and so important that its actuarial aspects are a matter of the highest public concern. It is my opinion that the financing of the system is sound; and that my successor will have a most important role in keeping it so.

Although it will not be my responsibility to select a new Chief Actuary, I feel a personal obligation to do what I can to assure that he be one with the highest of credentials. Inquiry about the opening can be made through normal channels by contacting the Social Security Administration in Baltimore; or they can be directed to me at 330 C Street, S.W., Washington, D. C. 20201 or (202) 962-2535.

C. L. Trowbridge

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Civil Service Retirement System

Sir:

Mr. Veits' letter, published in the November 1972 issue of *The Actuary*, is primarily concerned with Social Security but he also refers to the Civil Service Retirement System as being in a "pathetic state." While I know of no accepted actuarial definition of "pathetic," I assume this refers to projections that the Civil Service Retirement Fund will be depleted in the next decade. In the 1960s, these projections had been made and presented to Congress in order to support actuarially sound funding of the Civil Service Retirement System. Public Law 91-93, passed in 1969, put the funding of the System on a sound basis. However, since the correction received much less publicity than the problem, the impression remains with many people that the System will soon have to operate on a pay-as-you-go-basis.

The current law provides for funding on three levels. First, each covered employee must contribute 7% of his basic salary and this amount is matched by his employing agency. The total of 14% was alproximately equal to the entry-age normal cost in 1969. The legislative history indicates that if there is a substantial change in the normal cost, the Congress will act to adjust the contribution rates to equal the normal cost.

The second level of funding is to amortize, over thirty years, the liability created by any salary, benefit, or coverage increases provided for by legislation after 1969.

The third level is to pay the interest on any unfunded liability arising from legislation enacted prior to 1969 and any benefits attributable to military service. In order to soften the immediate impact, the law provided that only 10% of the third cost was paid in 1971, 20% in 1972, and so on until 100% will be paid after 1979.

Any reasonable projection now shows that the Fund plus future income will be sufficient to provide future benefits. I hope that this brief description will correct any impression that the Civil Service Retirement System is in a "pathetic" state.

Edwin C. Hustead
Chief Actuary,
U.S. Civil Service Commission

Thoughts on Population

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United States population ranging from about 270 million to more than 320 million by the year 2000, depending on the fertility assumptions chosen.

The new year was here and so was a new study, *Current Population Reports P-25 No.* 493, dated December 1972, with revised population projections for the United States. Numbers based on the highest fertility assumptions of the earlier report (Series B) were discarded and a new series (Series F) based on fertility assumptions of less than replacement (zero population growth) was introduced. A spread of one child (1.8 to 2.8 children per woman) led to a projected difference of 50 million persons in the size of the United States population by the year 2000—250 million versus 300 million. Series B assumed that the average number of births per woman upon completion of childbearing was 3.1, Series C—2.8, Series D—2.5, Series E—2.1, and the new Series F—1.8.

The crude birth rate had fallen to an all-time low during 1972, less than 16 per 1,000 population. Surveys had shown that birth expectations were also lower in 1972. But the larger number of women entering the major childbearing ages (ages 20-29), projected to increase from 16.1 million in 1972 to 20.7 million in 1984, will offset the decline in number of births per woman assumed in the low fertility Series F and lead to a projected increase in the number of births and crude birth rates in the 1980's by all four projections. After a decline. both births and birth rates would increase again in the mid-1990's under Series C and D. But while births would also rise in the mid-1990's for Series E and F, birth rates would not.

Series C, D, E, and F all project a continued population increase to the year 2000. Under Series C and D the annual growth rate would range between 1.[illegible] and 1.5 per cent, under Series E between 0.6 and 1.0 per cent, and under Series F between 0.4 and 0.8 per cent. Between the years 1972 and 2000 the population will increase 43.8 per cent under Series C, 36.9 per cent under Series D, 26.6 per cent under Series E, and 20.0 per cent under Series F—Series C having a percentage increase more than twice than that of Series F. The differential is restricted to the population under age 30, i.e., those born during the period 1972 to 2000. As only one set of mortality and immigration assumptions was used, the increase in population at ages 30 and over is the same for all the series. The median age will increase from 28.1 in 1972 to 29.1 years in 2000 under Series C, to 31.1 years under Series D, to 34.0 years under Series E, and to 35.8 years under Series F.

To better understand the implications of population growth, whether at an increased or diminished pace, a study of *Population and the American Future: The Report of the Commission on Population Growth and the American Future,* (see *The Actuary*, September 1972) is strongly recommended. □