The Actuary

The Newsletter of the Society of Actuaries

VOLUME 6, No. 1 JANUARY, 1972

KEYNES AND INFLATION

by Arthur Pedoe

Rarely a day passes without the name of Keynes being mentioned in the financial press. We now have President Nixon's announcement of the price and wage freeze, the cutting loose of the American dollar from gold, etc. Reading the comments on the President's action, one seems to be reading again the discussions and criticisms of John Maynard Keynes' theories and suggestions. Keynes died 25 years ago.

In the February 1971 issue of *The Actuary*, Keynes name is mentioned in a review by Ed Wells of my text on life insurance and pensions. I quoted Keynes' views on debauching the currency as a heading to the chapter on Inflation. Ed Wells thought it curious that Keynes got a peerage for pressing views on government expenditures resulting in the debauching of the British pound which he had so strongly condemned. A re-examination of Keynes' idea is important in view of President Nixon's action, particularly to actuaries.

The quotation is from *The Economic Consequences of the Peace* in which Keynes, attached to the British delegation involved in the Treaty of Versailles following World War I, attacked the Treaty. It was prophetic about the evils of inflation:

"Lenin is said to have declared that the best way to destroy the Capitalist System was to debauch the currency. By a continuing process of inflation, governments can confiscate, secretly and unobserved, an important part of the wealth of their citizens . . . Lenin was certainly right. There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency. The process engages all the hid-

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WELCOME

We welcome to the Chicago Office, Mr. Bernard A. Bartels who took office on January 1 as Administrative Officer of the Society.

ACTUARIAL SCIENCE PROGRAM AT GEORGIA STATE UNIVERSITY

by Robert W. Batten

Georgia State University in Atlanta has been the center of actuarial education in the Southeast since 1958. Aided by both the financial and moral support of the Southeastern Actuaries Club, the University's program at present includes approximately 80 students working toward a Bachelor's, Master's, or Doctor's degree.

The actuarial science program is part of the Department of Insurance in the School of Business Administration. An advantage of being a part of the Business School is that an actuarial science student is able to enroll in courses in insurance, economics, finance, accounting, business law, computer sciences, management, marketing, international business, and real estate—courses not provided in the School of Arts and Sciences. However, the student takes all of his basic mathematics courses from the Department of Mathematics and takes about one-third of his total course work in other departments of the School of Arts and Sciences. So he has the best of both worlds.

The undergraduate student's program consists of background courses in the humanities, social sciences, and business-related disciplines, and of 45 quarter hours in actuarial science courses covering basic actuarial principles and all ma-

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CONSUMERISM IN CINCINNATI

by Thomas Mitchell

Three topics on the relationship of consumerism and life insurance were discussed by a panel at the Oct. 6 meeting in Cincinnati of the Actuaries Club of Indiana, Kentucky and Ohio. Panel members were Kenneth E. DeShelter, Director of Insurance for the State of Ohio, Dale R. Gustafson, and Abbas Yoursi, Ph.D., Chairman of Insurance Department at the University of Concinnati.

Judge DeShelter suggested the areas where the life insurance industry was most vulnerable to attack from consumer advocates were: (1) misrepresentation of product (basically advertising and sales presentations); (2) inability to find a legitimate basis of cost comparison; and (3) failure to bring pressures to bear in controlling medical costs.

Mr. Gustafson mentioned four areas of vulnerability, but made it clear that vulnerability does not imply guilt. Three areas are the size and accumulation of assets and economic power by the industry, aloofness and slowness to change in the past, and the public image of the insurance industry. The public does not distinguish between the various kinds of companies, auto, life, health, etc. but sees the industry as a whole and transfers criticisms of one branch indiscriminately to all.

The fourth area is our distribution system. Insurance is a "highly touted socially desirable product that nobody wants to buy." This results in an adversary sale situation, which in turn gives rise to higher distribution costs and makes it more difficult to control sales excesses.

Professor Yousri pointed to the unmet needs for useful social investments, particularly in urban real estate, and also mentioned the accumulation of wealth.

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The Actuary

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Published monthly (except July and August) by the SOCIETY OF ACTUARIES, 208 S. LaSalle St., Chicago, Illinois 60604, Robert J. Myers, President, William A. Spare, Secretary, and John T. Birkenshaw, Treasurer.

The Society is not responsible for statements made or opinions expressed in the articles, criticisms, and discussions in this publication.

EDITORIAL

THE Summaries of Reports submitted to the Board of Governors are always interesting reading. In the latest group of reports the longest and perhaps the most interesting is that of the Committee on Professional Development. Like "the shot heard round the world" the repercussions of this report will be with us for a long time. Mr. Campbell and his colleagues are to be congratulated on a thorough and thought-provoking job.

Apparently there was no minority report disagreeing with some of the recommendations. There is at least one about which there might be some serious questioning and that is I 4. *Establish accepted actuarial principles.* presumably is the answer to Generally Accepted Accounting Principles which have been troubling the actuaries recently. Based on a limited exposure to GAAP we have not been impressed. Some of the principles seem to be of the "Be sure to make and record an accurate count of the spoons" variety. More important, however, is the fact that, according to the press reports, there is not universal agreement among the CPA's as to some of the recommended principles being "generally accepted." The CPAs however can patch up their own differences. The actuaries should be concerned with their own principles which apparently are to be absolute rather than "generally accepted."

Somehow or other we have been under the impression for many years that one of the objects of the examinations was to teach the student actuarial principles and how to apply them. In their application there is a considerable degree of judgment to be exercised by the individual actuary and obviously other actuaries may not always agree with his judgment. Where then does the "accepted" part come in? A profession must require from its practitioners a high degree of competence and adherence to a code of professional conduct. These are not merely "accepted"; they are essential and these the Society already possesses.

Somebody, we hope, will dispel our ignorance, preferably by examples. Meantime we will look to see whether some other professions have published "Accepted Engineering Principles" or "Accepted Legal Principles."

A.C.W.

LETTERS

ORSA

Sir:

On the behalf of the Operations Research Society of America, I would like to extend a cordial invitation to the members of the Society of Actuaries to attend and participate in our 41st National Meeting, to be held at the Jung Hotel in New Orleans, April 26-28, 1972.

Of particular interest in the extensive program will be the session on Actuarial Science, Insurance, and Risk Management, chaired by Dr. John McGuinness. This session has been designed specifically to include invited papers on operational research applications to risk management and insurance. Other sessions deal with cost effectiveness, budgeting, long-range planning, health planning policies, health care systems, portfolio management, mathematical techniques for solving various optimal allocation and investment-type problems, stochastic processes, and similar topics that should also be of interest and value to actuaries.

The regular ORSA registration fee will be applicable to all non-ORSA members who attend. We anticipate a registration fee of $30 to $35, which will include the banquet. Individuals interested should get in touch with me at the Graduate School of Business Administration, Tulane University, New Orleans, La. 70118.

We hope that by this invitation we can help establish between the members of our two societies broader personal and professional relationships and communications which will be of lasting mutual benefit.

Richard E. Beckwith

* * * *

Actuaries in Literature

Sir:

I have come across another author who seems to have some idea of the existence of actuaries.

In describing how unusual it was that one of his characters wanted to be a politician from when he was a small boy, Leslie Waller says in *The Family*, "He might well have chosen sewer engineering or actuarial statistics."

While this is not great humour, I think we will all get the point and can agree that it is unnecessarily cruel — whether to actuaries or sewer engineers, who can say?

F. J. Thompson

ACT: AN ACTUARIAL PROGRAMMING LANGUAGE

BY DAVID R. W. JAMIESON

In the March issue, an article by Mr. De Vries discussed the potential of APL as a basic actuarial programming language. From personal experience I have found that this potential is virtually unlimited, particularly if we treat APL as the fundamental starting point for the long-sought actuarial programming language, rather than the end product.

Background

In June, 1970, several members of the planning staff of the Sun Life of Canada began to experiment with APL. The all-around superiority of the APL language as a mathematical computational tool was immediately evident, and by September it had been decided to instal the APL time-sharing system on an "in-house" basis. At that time, apart from some time-sharing companies, the Sun Life was one of the few commercial organizations in North America that were running APL in-house, previous use being restricted basically to several universities and establishments such as NASA.

During the past year many applications have been undertaken using the APL system. A few examples might help to demonstrate the versatility of the APL language—a system to handle the day-to-day calculations of special individual annuity quotations, another to handle prepaid premium calculations, an estate analysis package, property investment cash flow analyses, and special valuations of small groups of business. The latest use has been the construction of simulation models for use in corporate financial planning. There is no question that more and more applications in the future will be handled with the APL system.

The major applications of APL, however, have probably been those involving the ACT language. Of these, the most outstanding has been the creation for our United Kingdom business of a complete rate file of policy values (net premiums, reserves, cash values, and so on), which involved programming the myriad idiosyncrasies to be found in approximately one hundred and forty distinct plans issued over the last sixty years. The actual programming time involved was of the order of ten man-weeks. Those readers with data-processing experience on similar tasks, using the computer in a batch environment and such languages as COBOL, FORTRAN, or ASSEMBLER, will appreciate the extreme significance of this figure.

Introduction

ACT is a notational language for use in a time-sharing environment and consists of a comprehensive set of macro functions defined in APL. In the development of ACT, two basic aims were followed: (*a*) the need to provide a high-level user-oriented language, where the high-level macro or function notation used corresponds directly to the existing standard actuarial publication notation, and (*b*) the need to provide complete flexibility of operation of the language in terms of the mortality and interest basis required, without the enormous storage requirements involved in retaining monetary tables of even a few of the simpler functions on all the required bases.

One of the most significant features of APL, the ability to handle vectors as single operands, led to the immediate resolution of the second of the basic aims stated above. At the same time, the ACT language has been developed in such a way that this same powerful feature is incorporated in every macro function. Also, all the symbolic mathematical operators of APL may be intermixed freely with the macro functions of ACT. The ACT language, therefore, extends the scope of APL into the realm of actuarial mathematics.

Initial Development

My early experiments with APL as an actuarial tool were almost identical with the simple procedures described in Mr. De Vries' article. APL's unique handling of vectors and matrices, or arrays of higher rank, allows the manipulation of many numbers (such as a table of l_x values) as a single entity. Let us suppose we have entered a table of l_x values and named the vector *TABLX*. The following two simple programming instructions,

```
[1]  W←(ρTABLX)−1
[2]  XR←0,ιW
```

establish the global variables *W* (the limiting age of the particular table currently stored in *TABLX*) and *XR* (a vector of the range of ages covered by the table). (The APL operator ρ acting monadically on a vector gives the number of elements in the vector; the ι acting monadically on the scalar *W* gives a vector of all the integers from 1 to *W*; the comma catenates the integer 0 with the vector ι*W*.)

Let us now set aside the letter *I* to be a global variable which will contain any desired interest rate. The following one-line program may now be written for the present-value function v^x:

```
∇ Z←VX X
[1]   Z←÷(1+I)*X
∇
```

(The APL operator * raises $(1+I)$ to the power of *X*; the operator ÷ acting monadically gives the reciprocal.)

Now we are in a position to write another one-line program to create *in one instruction* the complete table of values of the commutation function D_x:

```
[1]  TABDX←TABLX×VX XR
```

Another two or three minutes of simple programming gives us the facility to produce *all* the commutation function tables (or vectors) on the basis we have selected; for example, we might create *TABMX* as follows:

```
[1]  TABMX←(TABNX×VX 1)−1↓TABNX,0
```

Again we create simultaneously, for all values of *x*, values of $M_x = vN_x - N_{x+1}$. (The APL operator ↓ is used to drop any number of elements from a vector.)

Perhaps one of APL's striking features is already evident in

these simple programming instructions: the user is never concerned with the normal specification problems associated with programming, such as size, format, addressing, and the like. This is all handled by the APL operating system at the time a named variable is given value during execution.

In the ACT system the simple programs described above have been grouped together as a set of initialization functions, using appropriate names (*CTABDX* to create *TABDX*, and so on). The only data stored are mortality data, consisting of a library (*MORTABS*) of l_x vectors covering all the mortality tables in common use, which involves, surprisingly, an insignificant amount of storage space. APL libraries may be accessed by a single instruction, so that the user now can sit down at his computer terminal and, after signing onto the system, execute in order, say,

```
)COPY MORTABS M58CSO
CTABLX
I ← .025
CTABDX
CTABNX
CTABSX
CTABCX
CTABMX
CTABRX
```

He now has available *all* the commutation values on the 1958 CSO Male Table at 2½ per cent—the whole process taking only a few seconds.

Language Development

So far, so good—but not really revolutionary. I am sure almost every programming language in existence has been used time and time again to create commutation function values in many different ways. What advantage does APL have over any other language or system?

First, because of the extreme conciseness of the APL language and the range of powerful symbolic mathematical operators available, we can achieve a fantastic degree of programming brevity and clarity. Second, anyone should be able to assimilate enough knowledge of the APL system and language in less than an hour to begin to make use of its essential features, so that perhaps we can dispense with the communication problems associated with using the services of intermediary programmers.

But we have gained much more. Let us look now at another feature of APL—that which allows us to use the results of the above initialization procedures to develop a true actuarial programming language. Having created vectors, or arrays, in our APL workspace, we have the facility to select one or more of the values which they contain by a process known as indexing. Thus, if we wish to obtain the value of D_0 from our vector *TABDX*, we need to enter *TABDX*[1]. The values of D_0, D_{50}, D_{65} could be obtained simultaneously by entering *TABDX*[1 51 66].

Why not, therefore, write a small program with the name *D*, as follows:

```
∇ Z←D X
[1]   Z←TABDX[X+1]
∇
```

Now we can obtain the values of D_0, D_{50}, D_{65} by entering *D* 0 50 65, or we could specify the parameter *X*, that is, *X* ← 0 50 65, and simply enter *D X*. In another thirty seconds, five more programs will be added to our language; of course, the reader will have guessed their names; *N*, *S*, *C*, *M*, *R*. Now that we have started the snowball rolling, the only question is where to stop.

Let us quickly write two more macro functions for the ACT language:

```
[1]  Z←(N X)÷D X
```

and

```
[1]  Z←(M X)÷D X
```

Of course, we immediately recognize the results these programs will give, namely, $\ddot{a}_x$ and A_x. If, for example, we set the execution parameter *X* to be a whole range of values, then we would get the whole corresponding range of annuity values or net single premiums returned *simultaneously*. Now, that's performance!

How do we execute those program lines? Shall we call them *PROGRAM*1, *PROGRAM*2? Obviously not. We must turn our attention to the notation to be used in developing the language: what names shall we give to the macro functions for actuarial values? Obviously, writing the programs is easy, now we have a problem worthy of a little thought.

Notation

The development of the ACT notation was necessarily geared to the present unique terminal keyboard design developed for APL. This design, in order to incorporate the range of symbolic mathematical operators required, does not use lowercase letters. Accordingly, all of the macro function names in ACT are built using uppercase letters (and numerals where order of contingencies requires indication), either singly or in combination, as components. All of the macro functions are "notationally" self-documenting, not only in their one-to-one correspondence to the equivalent actuarial publication notation as it now exists but also in terms of indicating the execution parameters required and their relative positions in relation to the function name.

Each function name can consist of the following elements in some combination: (*a*) PRE-PARAMETERS, (*b*) PRE-OPERATORS, (*c*) ROOT, (*d*) POST-OPERATORS, and (*e*) POST-PARAMETERS. As mentioned above, only uppercase letters (and numerals) are used to define *all* ROOTS, OPERATORS, and PARAMETERS. This apparent restriction turned out to be an immense advantage as the language notation developed, since it exercised a controlling influence enforcing extreme simplicity and consistency. As a result the ACT language notation possesses characteristics that might be considered desirable in a standard international programming notation for actuarial work. In fact, the notation is being considered in this light by working groups of the Committees on Research for both the Society and the Institute of Actuaries in England. Unfortunately, space does not permit a lengthy description of the notation development, but hopefully the following simple examples covering several groups of functions will establish the basic principles involved.

Annuity Functions

The following "language elements" are used to form the macro names for various annuity functions.

a) PRE-PARAMETERS:

DT	: ${}_t\vert$	Deferred period

b) PRE-OPERATORS:

D	: *D*	Decreasing
I	: *I*	Increasing

c) ROOTS:

AN	: *a*	Annuity
AC	: *s*	Accumulation

d) POST-OPERATORS:

D	: ¨	Due

e) POST-PARAMETERS:

X	: *x*	Age
N	: *n* (or *t*)	Duration
M	: (*m*)	Frequency of payment

The principles adopted in combining "language elements" to form macro function names will be evident from a brief study of the following examples.

ANX	: a_x	*ANDX*	: $\ddot{a}_x$
ANXN	: $a_{x:\overline{n}\vert}$	*ANDXN*	: $\ddot{a}_{x:\overline{n}\vert}$
ANXM	: $a_x^{(m)}$	*ANDXM*	: $\ddot{a}_x^{(m)}$
ANXNM	: $a_{x:\overline{n}\vert}^{(m)}$	*ANDXNM*	: $\ddot{a}_{x:\overline{n}\vert}^{(m)}$
ACXN	: $s_{x:\overline{n}\vert}$	*ACDXN*	: $\ddot{s}_{x:\overline{n}\vert}$
DTANX	: ${}_t\vert a_x$	*DTANDX*	: ${}_t\vert \ddot{a}_x$
DTANXN	: ${}_t\vert a_{x:\overline{n}\vert}$	*DTANDXN*	: ${}_t\vert \ddot{a}_{x:\overline{n}\vert}$
DTANXM	: ${}_t\vert a_x^{(m)}$	*DTANDXM*	: ${}_t\vert \ddot{a}_x^{(m)}$
DTANXNM	: ${}_t\vert a_{x:\overline{n}\vert}^{(m)}$	*DTANDXNM*	: ${}_t\vert \ddot{a}_{x:\overline{n}\vert}^{(m)}$
DANXN	: $(Da)_{x:\overline{n}\vert}$	*DANDXN*	: $(D\ddot{a})_{x:\overline{n}\vert}$
DANXNM	: $(Da)_{x:\overline{n}\vert}^{(m)}$	*DANDXNM*	: $(D\ddot{a})_{x:\overline{n}\vert}^{(m)}$
IANX	: $(Ia)_x$	*IANXM*	: $(Ia)_x^{(m)}$
IANXN	: $(Ia)_{x:\overline{n}\vert}$	*IANXNM*	: $(Ia)_{x:\overline{n}\vert}^{(m)}$

While the pattern of development should be clear from these examples, perhaps some of the advantages are also evident. With the complete removal of notation devices such as brackets, colons, and other symbols, the more complicated actuarial expressions actually involve fewer characters. Also, the notation becomes applicable to other programming language bases, where often such symbols have been assigned specific meanings.

At first sight the ACT names appear to be just a meaningless jumble of letters, but very quickly the eye adjusts to the format and one can virtually "read" the function names—for example, *DANDXNM*: a decreasing annuity-due to *x* for *n* periods payable *m*'thly. Of course the converse "translation" also holds, in that one can, almost without thinking, construct the ACT function name for any given actuarial expression.

Also, as mentioned before, the fact that the function names indicate not only the execution parameters required but also their relative positions is a distinct advantage; for example, the value of ${}_5\vert\ddot{a}_{40:\overline{25}\vert}^{(12)}$ would be obtained by executing the dyadic function *DTANDXNM* as follows: 5 *DTANDXNM* 40 25 12.

Assurance Functions

A few more examples selected from various catagories of assurance functions may serve to emphasize the essential characteristic of the notation development, namely, the consistent patterns adopted in combining language elements. First, a few additional elements must be defined.

a) PRE-PARAMETERS:

T	: *t*	Duration of limited premium-paying period (premium functions)
N	: *n*	Duration of limited premium-paying period (other than premium functions)

b) PRE-OPERATORS:

M	: —	Medial

c) ROOTS:

A	: *A*	Net single premium
AP	: *P*	Net annual premium
V	: *V*	Terminal reserve
CV	: *CV*	Cash value
W	: *W*	Paid-up amount

d) POST-OPERATOR:

A	: *A*	Adjusted (premium)

Selecting some examples at random from the comprehensive set of single-life assurance functions already available in ACT, we have:

AX	: A_x	*AX1N*	: $A_{x:\overline{n}\vert}^{1}$
AXN	: $A_{x:\overline{n}\vert}$	*AXN1*	: $A_{x:\overline{n}\vert}^{\ 1}$
DTAX	: ${}_t\vert A_x$	*DAX1N*	: $(DA)_{x:\overline{n}\vert}^{1}$
APX	: P_x	*APXNM*	: $P_{x:\overline{n}\vert}^{(m)}$
TAPX1N	: ${}_tP_{x:\overline{n}\vert}^{1}$	*TAPXM*	: ${}_tP_x^{(m)}$
APAX	: P_x^A	*TAPAXN*	: ${}_tP_{x:\overline{n}\vert}^{A}$
TVX1N	: ${}_tV_{x:\overline{n}\vert}^{1}$	*NTVXN1*	: ${}_t^{n}V_{x:\overline{n}\vert}^{\ 1}$
TMVX	: ${}_{t-1/2}V_x$	*NTMVXN*	: ${}_{t-1/2}^{n}V_{x:\overline{n}\vert}$
TCVXN1	: ${}_tCV_{x:\overline{n}\vert}^{\ 1}$	*NTCVX*	: ${}_t^{n}CV_x$
TWX	: ${}_tW_x$	*NTWXN*	: ${}_t^{n}W_{x:\overline{n}\vert}$

Finally, it is worth repeating that, if the execution parameters of any ACT function are set to be compatible ranges of values, a corresponding complete range of results will be returned simultaneously.

Future Extensions

The basic portions of the ACT language which have already been implemented are concerned primarily with single-life annuity and assurance functions using ultimate mortality. Other features available are sets of pure interest functions, mortality functions, and valuation functions, together with the facility to use projected mortality and interest rates varying with duration.

The basic work necessary to extend the ACT language to use select mortality has also been completed. The notation adopted to indicate the use of select mortality makes use of another feature of APL, namely, the facility to underscore any letter of the alphabet, the resulting composite symbol being treated as unique. Thus, while we would have l_x written as LX in the ACT notation, the expression $l_{[x]+t}$ becomes simply $L\underline{X}$. This beautifully simple device (admittedly artificial and unique at present to an APL implementation of the notation) preserves the one-to-one correspondence of the programming and publication notations as already described, at the same time indicating the use of select mortality. The basic indexing procedures are easily derived, interpreting the $\underline{X}$ parameter as a vector of (x_i, t_i) elements and operating on tables which are now partly matrices.

Future extensions to the incorporation of multilife functions and multiple decrement functions and to areas such as group and health insurance are more than feasible. While the notation development will follow naturally from the guidelines already established, the programming of the macro functions desired will be greatly facilitated by APL's unique handling of arrays.

Editor's Note: *Mr. Jamieson is a student of the Society, and he very kindly responded to our invitation to tell us about ACT, a new programming language which he developed.*

Keynes and Inflation

(*Continued from page 1*)

> den forces of economic law on the side of destruction, and does it in a manner which not one man in a million is able to diagnose . . ."

The book made Keynes' name famous. After five years Germany obtained far more lenient terms, but in the long drawn out agony of those five years the value of the German mark was reduced to zero and brought on Hitler and World War II. I have met some who treat this German experience of inflation as a myth of little bearing on present day affairs.

Keynes was consultant to the British Treasury throughout World War II, making six journeys to the United States in connection with financial matters of the greatest importance; his peerage, awarded in 1942, was for this public service.

In May and June 1971 the Canadian Senate had a Committee on National Finance examining economic trends. Thirty briefs were submitted by leading experts from the United States, Canada, Britain, Germany, and Japan; the result was 30 individual viewpoints. The academic economists argued, generally, that control of prices and wages would be ineffective and difficult to administer. A concluding comment by the Governor of the Bank of Canada was: ". . . economics is not yet and probably never will completely be an exact science." One professor of economics (Chicago and London School of Economics) is quoted as stating that a more or less steady rate of inflation of 15—30% or more can be tolerated. After all, some South American countries experience this and survive! The average annual rate of depreciation of money in the ten years 1960-1970 in Argentina was 17.5%; in Brazil 30.6%.

The serious point is that the rate of depreciation of money is quickening in many countries: in the U.S. during the first half of the 1960s, the dollar lost only 6% of its buying power, whereas during the second half of that decade it lost 19% of its domestic value. In most countries 1970 was definitely worse than the average for the decade 1960-70, and in many countries 1971 is worse than 1970. The historical development of this trend is important in watching developments arising from President Nixon's move.

In the 1920s in England prices were falling, unemployment was severe; the government followed a policy of deflation to restore the Gold Standard, which it did in 1925 at the pre-war parity. As a result, the large coal export trade suffered, miners wages were cut followed by a coal miners strike and a general strike. In 1923 Keynes had published *A Tract on Monetary Reform* which would contradict the charge that he was a congenital inflationist. He stresses the necessity for a stable value of money and challenged the role of the Gold Standard in providing stable prices and stable rates of exchange. As stated, his views were ignored. Keynes continued to attack the classical economic theory that the trade cycle was the automatic control of the economic system; that governments should not interfere and wages and prices and unemployment would all adjust themselves—*laissez faire*; the Gold Standard was part of this system. Keynes wanted government direction of the economy, not *laissez faire*.

During the 1920s other countries were prospering. In the United States the general well-being led to the boom when people would borrow at any rate of interest to buy shares or increase money-making facilities in an increasing prosperity which would go on forever! The crash came in October 1929 and not only ruined many Americans but spread ripples of disaster over the entire world. By 1932 the value of world trade had fallen to one-third of the 1929 level and unemployment was calamitous—in the U.S. about 25% and in Britain 22%. The situation was extremely grave in Britain with a serious outflow of gold, and in September 1931 Britain left the Gold Standard. Keynes' advice had been ignored and it was realized what a disastrous mistake had been made.

A Commission appointed by the Labour Government in Britain to advise on government policy reported in 1931. It recommended increases in taxation, drastic cuts in government expenditures such as unemployment benefits and civil service salaries. The whole point was to get a balanced budget. It was the reverse of what Keynes had been urging. Keynes referred to this May report as "The most foolish document I have ever had the misfortune to read." May was an actuary in the service of the Prudential of England, who made his way to the top through the investment side and for his public service was awarded a knighthood, then a baronetcy and finally a peerage. Is he the only actuary to have

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Keynes and Inflation

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become "My lord"? One should realize the extraordinary times in which Keynes worked and the acute problems for which he sought to find answers.

President Roosevelt in his 1932 election campaign made a strong commitment to have a balanced budget and reduce government expenditure and began his Presidency with an economy drive and a slash in public pay. This was before the inauguration of the New Deal in 1933.

In 1936 Keynes published *The General Theory of Employment, Interest and Money*. It has been described as one of history's major intellectual achivements and largely revolutionized economic theory. It is basically an analysis in terms of fundamental economic principles of the causes of unemployment. It was addressed to his professional colleagues and is a difficult book to read. Keynes sought to show governments how, by controlling the level of demand, they could ensure "full employment." This may be defined as when reasonably efficient workers willing to work at current prevailing wage-rates do not find themselves unemployed as a result of too little demand.

Keynes was confident that by government action one could cure the great social evils of unemployment and poverty without the alternative of state socialism. In the years since Keynes outlined his theories the very success of the action has created conditions from which has sprung another problem: rising prices, against which the action is largely ineffective. Apart from the problem of controlling demand, there are the problems of labour union power challenging that of management and the state, profit levels in industry, and prices set by huge concerns which dominate an industry and are in effect a monopoly although subject to anti-trust laws. Any government attempt to control these factors is called a "Prices and Incomes Policy."

One may ask what Keynes had to say about these emerging problems, particularly rising prices and inflation.

In 1937 Keynes suffered a severe heart attack. When war broke out in 1939 he was attached as a consultant to the British Treasury, which used him as an emissary to the United States in the many financial problems arising out of armament purchases and war finance.

Actuarial Meetings

Feb. 15, Actuaries Club of Philadelphia
Feb. 15, Chicago Actuarial Club
Feb. 16, Seattle Actuarial Club
Feb. 16, Nebraska Actuaries Club
Feb. 16, Actuaries Club of Des Moines
Mar. 9, Baltimore Actuaries Club
Mar. 15, Actuaries' Club of Des Moines
Mar. 15, Seattle Actuarial Club; Portland Actuarial Club (Oregon)
Mar. 20, Chicago Actuarial Club
Mar. 22, Nebraska Actuaries Club, Omaha
Mar. 28, Actuaries Club of Hartford

Keynes was a man who got involved in a multitude of tasks little related to those mentioned here. He was a master of detail and took charge of most operations with which he was connected. One is astonished at the burdens permitted to fall on the shoulders of a man subject to recurrent heart attacks. After the war ended (1945) he was the emissary arranging a major loan from the United States to restore Britain's shattered finances. He died early in 1946. Lord Keynes' reputation as one of the greatest Englishmen of his age has increased as the years have passed. The world has been moving Keynes' way.

The question arises what would Keynes have done facing the problems of our day. He believed that the state would have to intervene at many points, yet he was essentially, an individualist. President Nixon is preparing to face a major world problem and it is to be hoped that he will succeed. Inflation is destructive of saving—in particular of long-term saving; life insurance and pensions are particularly vulnerable. □

SOCIAL SECURITY NOTES

Marice C. Hart and Jane M. Ceccarelli.—"History of the Provisions of Old-Age, Survivors, Disability, and Health Insurance." Social Security Administration, June 1971.

This 10-page booklet traces major legislation for the OASDHI system from 1935 to the present replacing legislative histories published earlier. The arrangement is by topic. The section about the benefit formula gives by implication the rationale for the seemingly clumsy formula now in effect.

Free copies may be obtained from the Office of the Actuary, Social Security Administration, Washington, D.C. 20201.

Georgia State

(Continued from page 1)

terial included in the first three Society examinations.

An exceptional high school graduate could pass Part 1 as a freshman and thus be able to complete the courses in life contingencies as an undergraduate. Most students, however, do not attempt Part I until sophomore year and, take the probability and statistics courses as juniors and the numerical analysis, interest theory courses as seniors.

The candidate for the Master of Actuarial Science degree completes courses in life contingencies, graduation, demography, construction of tables, and administrative practices, and several elective courses from areas such as social insurance, group insurance, pensions, life insurance accounting, operations research, and insurance law. In addition, the Master's candidate takes an actuarial science seminar course in which he makes an in-depth study of some actuarial topic included on the Fellowship Examination syllabus.

Actuarial science is one of the fields of study which may be chosen by a candidate for the degree of Doctor of Philosophy in Business Administration (Ph. D.) or Doctor of Business Administration degree (D.B.A.).

Georgia State also conducts actuarial seminars at various times during the year for Parts 1 through 7. These seminars have helped actuarial students who have been preparing through self-study while engaged in full-time employment. Advance testing permits the student and his employer to assess his readiness to benefit from the seminar, as the seminar can do no more than help with the student's final preparation. Marginally prepared students are discouraged from attending. During the last six years, more than 170 students have been successful on actuarial exams taken immediately after attending a preparatory seminar at Georgia State.

Persons desiring further information may contact Robert W. Batten, Department of Insurance, Georgia State University, 33 Gilmer Street, S.E., Atlanta, Georgia 30303. □

ERRATUM —

On page 1, third column, 1st paragraph, mispelling of Cincinnati.

Our apologies,
THE PRINTER

Consumerism in Cincinnati

(Continued from page 1)

also pointed towards need for reform of credit life insurance, and suggested the life insurance industry never made a sufficient push for highway safety.

The second question related to the accuracy and completeness of information received by consumers on insurance. Mr. Gustafson pointed out that disclosure of premiums, benefits, cash values, and illustrative dividends, is complete price disclosure, but that the cry is for a comparison of "worth," which goes beyond simple price disclosure. Professor Yousri pointed out that the prospect does not know the expenses and commission charges levied against his policy. He posed the question "Should he know?"

Director DeShelter said the answer to the problem can be found only by investigating individual transactions. The consumer is vulnerable because his only reference background in making an intelligent decision comes from the agent. Hidden differential commission rates make the prospect even more vulnerable. Judge DeShelter critized agents' business cards which do not use the word insurance. He spoke to the problem of balance protection of a vulnerable consumer vs. the buyer's responsibility to make his own decision.

Professor Yousri felt that the industry could improve its consumer relationships by presenting a more confident image on campus through better qualified recruiters and better qualified agents. He also proposed policies linked with equity or property investments.

Mr. DeShelter asked that we hear the call of consumerism and the public, and that we work to improve the health delivery system. The industry should develop better ethical standards, he said. Although current investigations in Ohio center around agents, many of the patterns coming to light are obviously set in corporate offices, he maintained.

Mr. Gustafson questioned the real-life practicality in the past of insurance companies bringing pressures against medical costs. He also reviewed the insurance industry's Urban Investment Program, which involved 10% of cash flow (certainly not tokenism), but proved to peanuts from the national viewpoint. thought that much of the improvement of relationships with the public would have to come through local corporate citizenship. □

COMMITTEE CHAIRMEN: JANUARY 1972

We are glad to provide an up-to-date list of chairmen of committees in advance of publication of the Year Book. New chairmen are indicated by an asterisk.

Standing Committees	*Chairman*
Advisory Committee on Education and Examinations	Paul T. Rotter
Continuing Education	Walter N. Miller*
†Cooperate with Governmental Demographic and Statistical Agencies	Walter Shur*
Education and Examination	John A. Fibiger*
Elections (a)	Ernest J. Moorhead*
Fields of Activity	Anna M. Rappaport*
Investments	John T. Birkenshaw*
Mortality and Morbidity Among Lives	
Individually Insured	Joseph C. Sibigtroth*
Mortality under Ordinary Insurances and Annuities	Charles A. Ormsby*
Experience under Individual Health Insurance	Robert L. Whitney
Aviation	Donald J. van Keuren
Liaison with Assn. of Life Insurance Medical Directors	Edward A. Lew*
Mortality and Morbidity under Group and Self-Administered Plans	Richard H. Hoffman
Group Life and Health Insurance	Burton E. Burton
Group Annuities	Robert F. Link
Self-Administered Retirement Plans	Arthur F. Parry
Papers	William B. Waugh
Pensions (b)	James A. Attwood*
Press	Walter S. Rugland*
Professional Conduct	Kenneth H. Ross*
Public Relations	Herbert J. Boothroyd
Relations with Colleges and Universities	Russell H. Smith, Jr.
National Science Foundation Summer Institutes	Benjamin R. Whiteley*
Research	Cecil J. Nesbitt*
Review	John H. Biggs*
Standard Notation and Nomenclature	John M. Boermeester
Editorial Board for *The Actuary*	Andrew C. Webster
Editorial Board for *Transactions*	Floyd T. Beasley
Special Committees	
†Consider Providing Career Consultation	Wendell A. Milliman*
†Explore Details of Alternate Route	Harry D. Garber*
Professional Development	Paul A. Campbell
Study Educational Facilities for Actuaries	Robert C. Winters
Study Relations Between Society and Local Actuarial Clubs	Walter S. Dewar*
†Study Society Memorial Fund	Morton A. Laird*

†New committee.

(a) Formerly the Nominating Committee.

(b) Formerly Special Committee to Study Pension Plan Problems.

Social Security Note

Daniel F. Drennan. *Occupational Difference in Separation Rates for Railroad Workers*, 1965-68, RRB Actuarial Study No. 9, Railroad Retirement Board, July 1971.

This 39-page booklet presents separation rates by occupational group using nine occupational groupings and also rates for two supergroups, that is, all operating employees and all nonoperating employees. The rates given are those pertaining to nondisability retirement, disability retirement, final withdrawal before retirement, and death while in active service. The study gives age distributions and service information.

(Free copies may be obtained from the Office of the Chief Actuary, Railroad Retirement Board, Chicago, Ill. 60611).