

TRANSACTIONS

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ADDRESS OF THE PRESIDENT, EDMUND M. McCONNERY

THE RESPONSIBILITIES OF "SCIENTIFIC FINANCIERS"

A PRESIDENTIAL address usually deals with the current history of the association. However, our new Society is like the goddess Athena, who leapt fully grown from the forehead of Zeus. It has but recently emerged fully grown from two fountains of wisdom, therefore we have no history of our own, so let us discuss what our English friends in the London Times are pleased to call the responsibilities of "Scientific Financiers," and make our plans for the future.

THE MERGER

Our Society of Actuaries, although by legal technicalities a new organization, is in reality a merger by two honorable organizations, the Actuarial Society of America, sixty years old, and the American Institute of Actuaries, forty years old. Each had its body of knowledge, each had its traditions, each had the broad viewpoint of an adult and the realization that differences of opinion can be adjusted, and much forgiven, for the benefit of the new unit. Together, therefore, as one, our feet are set on the path that leads into the future.

Our thanks are due to the creative imagination and broad vision of those who have so ably brought about the merger and instructed us in the tenets of living together. This Society of professional men in voluntary and friendly association can develop, discuss and disseminate the application of the theory of probabilities to human affairs for the good of ourselves as individuals, for business, for our economy, our country and society as a whole.

As members of this new Society of Actuaries it is appropriate that we now attempt to take stock of ourselves and endeavor to foresee our responsibilities in the new social, political and economic civilization into which we are evolving—this new dynamic civilization that we call by so many names.

WHAT ARE ACTUARIES?

First, let us ask the question: "What are actuaries?" To attempt to define an actuary reminds one of the famous reply of a colored band leader

to the man who asked him to define New Orleans jazz: "Man, when you got to ask what it is, you'll never get to know."

We like to think that long ago in the mists of the dawn of intelligence some man, watching the trees of the forest tossing in the wind, noticed that the dreaded forest fire was started by rubbing of one dry branch against another. Then, by experimentation—or in the words of our motto: "Substituting facts for appearances and demonstrations for impressions"—he discovered that he, too, could produce that marvelous and destructive fire. We picture him in our mind crouching in his cave and cringing before that god-like thing . . . the light of the sun . . . that he had produced.

The Greek civilization was a far cry from primitive man, but here again we find our motto—this time applied to mathematics. In Plato's words: "You are aware that students of geometry, arithmetic and the kindred sciences take for granted the odd and the even, and the figures and the like in their several branches of science; assuming these things to be known they make them hypotheses, and henceforth regard it as unnecessary to give any explanation of them either to themselves or to others, treating them as if they were manifest to all; setting out from these hypotheses, they go at once through the remainder of the argument until they arrive with perfect consistency at their goal" (*Republic* vi. 510 c-e).

Moving on to the more modern times of only a few generations ago—in a civilization still harried at intervals by the Black Death, great plagues and fevers—we find those who wondered about the probabilities of death and the novel problems of calculation connected with mortality rates. They, too, decided to "substitute facts for appearances"—Halley of comet fame, Pascal, De Wit, De Moivre, Dr. Price and many others. Their names live in the history of the theory of probability and life insurance mathematics.

To such inquisitive minds, willing from the earliest times to observe and demonstrate, we owe the foundations of actuarial mathematics.

The actuary in reality is a sound, practical—rather than too theoretical—mathematician applying simple principles of probabilities to human affairs in the unknown future. He applies what facts he has to such unknowns as future mortality and morbidity rates, constantly changing for better and for worse in a scientific world of rapid development in medical research . . . and of atomic bombs; future interest earnings under governmental controls and what is left of free enterprise; future expenses under ever-changing money values; and future human emotions in regard to security, savings and family needs in a civilization that is meeting with some difficulty the challenges so well described by Toynbee. It is the

unfamiliarity with the rather simple principles involved in these calculations, rather than inherent difficulties in the mathematics, that has led even intellectually competent people to invest the process with some magical quality. Meanwhile, of course, the actuary "enjoys" . . . enjoys in two ways . . . a high reputation as a mysterious authority on the complexities of mathematics, living in an intellectual atmosphere beyond ordinary reach. He gains, therefore, some glory reflected from those "Einstein-ian" realms—but, as he surveys his roughly sculptured approximate formulae he may wonder if they are not rather "Epstein-ian," and as he reiterates over and over again his theme of mortality, morbidity, interest, expenses and emotions, he may become somewhat "Gertrude Stein-ian."

HOW IS THE ACTUARY TRAINED?

Second, let us ask: "How is the actuary trained?"

A famous English cook book, in describing rabbit pie, begins with the admonition: "First, catch your rabbit and the younger the better." A description of the training of an actuary might very well begin with that admonition slightly changed: "First, catch him and the younger the better." As science cannot yet determine or measure that peculiar quirk in the genes resulting in mathematical aptitude we must necessarily be patient for some time after birth. In due course, however, this aptitude becomes apparent in school and there we can "catch" him.

The educational process through which he must pass was exceptionally well described with remarkable intuition nearly one hundred years ago in a paper read before the Institute of Actuaries in London (*JIA* IV, 108) when the Institute was only five years old. I will take the liberty to paraphrase, quote from, and comment on this paper.

The author, Mr. H. W. Porter, states that "the foundation of all actuarial knowledge is mathematics" but that "a very abstruse mathematical knowledge is not absolutely requisite for the general business of an actuary." In fact, he rather deprecates the "closet meditation of the profound theorist."

The author gives eight commandments for the education of the actuary. Eight would have found favor with Clemenceau, who remarked on Woodrow Wilson's fourteen points: "Even the Good Lord has only ten." The author's eight are still the foundation of the actuarial examinations now prescribed in our syllabus.

First, the actuary should "have a good general education." He need not be "such a proficient in the Latin and Greek languages as to be able to write a disquisition on a disputed reading or a treatise upon a Greek participle." A good general knowledge of language is most advantageous.

Today, in our examinations, we test only one's native language in Part 1.

Second, he must have a sound mathematical knowledge with an admirable talent for its practical application. "The mere acquaintance with mathematical formulae is not sufficient to make an actuary—this is only one out of many kinds of knowledge requisite." "Even in computations where the mere theorist might be supposed to be quite at home, it is not sufficient at once to adopt the numerical result arrived at by calculation." "Judgment and experience, which cannot be taught (the one must be inherent to a certain extent, and carefully fostered; the other must be acquired), are necessary." In short, he must have statistical acumen. Let us hope that Parts 2 and 3 of our examinations will provide us with such paragons.

Third, he needs a sound knowledge of assurances and annuities, including the construction of tables. This is well covered in Part 4 and a portion of Part 5 of our syllabus and is the only really actuarially technical portion of our examinations.

Fourth, to quote Mr. Porter direct: "To be enabled to advise his board upon the acceptance of or rejection of doubtful cases, where the reasons for or against the acceptance are nicely balanced, or to determine the additional premiums that should be required, an actuary should not be totally ignorant of the causes and effects of diseases." Then the author states that the actuary should also "determine how far longevity may be influenced by social improvements such as the establishment of baths and wash-houses." A very English understatement of the knowledge of Selection of Risks required for Part 5 of our examinations!

Fifth, the education of the actuary should include a knowledge of finance. Let us quote Mr. Porter again: "He will have not only to advance the interests of his Company in every possible way, but it will be his duty to be ever on the watch for any change in monetary affairs which may possibly affect the future investments of the company or call for any alteration therein." This requirement appears in Part 7 of our examinations.

Sixth, again a quotation: "An actuary, moreover, should be a good accountant, inasmuch as the accounts of an assurance office are of a peculiar character, and sometimes involve very great niceties." Here, again, is Part 7 of our examinations.

Seventh, a knowledge of law was part of the education of the actuary of ninety-five years ago as it is today in our examinations. While Mr. Porter was aware of the legal aphorism "whoever is his own lawyer has a fool for a client," nevertheless, he recognized how useful a clever actuary can be to a lawyer and commented in this connection: "His legal knowledge, if sound,

may save the company much expense—his sphere of usefulness is enlarged, and he becomes a valuable coadjutor of the legal adviser of his company.”

Eighth, still another quotation: “The actuary should be a ready correspondent. He should be well read in all the literature appertaining to his profession, and should be prepared at all times to take advantage of any improvements that may enable him legitimately to extend the business of his office, as well as to be on his guard against unsound modes of business.”

Mr. Porter then sums up his view of the actuary in these words: “As a scholar, the actuary is continually in request. As a man of business, his services are invaluable.”

Today, the actuary is still required by his examinations for the Fellowship to have a knowledge not only of his mathematics but also of all the other phases of management of a life insurance company—investments, medical, insurance law, accounting, agency problems and social insurance. Thus he is fitted to apply his broad knowledge to many phases of business life.

Let it never be said of us as Massingham said of the exhaustion of the impulse of the Renaissance: “The eager curiosity of the natural sciences was split up into the fragments of specialization. Man no longer wondered; he tabulated and classified; losing the end in the means.”

The actuary, because of his training, should have acquired the habit of assessing facts and opinions dispassionately, and, what is equally important, making his contribution to the well-being of our civilization. Behind our bald statistics, our premium rates, the seemingly endless sheets of data, there is the knowledge that these all are in the service of human beings—to satisfy the innermost thoughts of a man for his wife and children—and his desire to leave a little bit of himself behind, even though for so short a time.

WHAT ARE THE RESPONSIBILITIES OF THE ACTUARY?

The responsibilities of all people are changing because we are now rapidly building in our Western civilization a new social structure.

First, therefore, let us look at this new structure. In history we see the English people, tired of the wars and harassments of the barons, gratefully turning power over to the absolute monarchy of the Tudors. Then, disillusioned on the score of the divine right of kings, they tried the dictatorship of Cromwell who, through ignorance regarding him, is so beloved of Americans. Then again, under an invited king and his German-speaking successor, power slipped into the hands of a land-owning aristocracy.

From then, in turn, in the rapid industrialization of the last century, power was concentrated in the hands of industrialists and financiers.

Now, the economy of our nations has grown so complicated and interwoven that it is almost beyond the capacity of individuals to understand the forces that govern their existence or cause the events in their lives. As mathematicians know, the larger the number of variables, the more difficult it is to arrive at a solution.

Many people, therefore, are but dimly aware of the vast and complex system that determines the value of the wages they earn, the stability of their jobs and their chances of living better or worse than people in other countries. Only subconsciously are they aware that their standard of living is dependent upon factors over which they have no control. They live an economic existence based on habit and propaganda. By habit they perform certain tasks for which they have been trained and thereby earn the wherewithal to buy the necessities and luxuries of life. By propaganda they are led hither and yon and are turning to "Government" as their savior, not because they have any profound belief in, or understanding of, the logic or lack of logic in Socialist theory or the Welfare State, but because they have looked upon events in their lifetime . . . wars, industrial anarchy, booms and depressions, the squalor and ugliness of industrial cities, and the terrors of unemployment . . . and they are afraid.

The new god—the Welfare State—naturally requires a priesthood . . . the bureaucrat or red tape worm . . . and there has been an accelerating shift of power into the hands of government bureaucracy.

Human nature, however, especially British and American nature, is protesting and stubborn, and no control can ever endure permanently in the hands of any one person or class. When we get tired, therefore, of the present situation there is a program waiting to our hand. It is not, vociferously and vainly, to denounce the transfer of ultimate power from monarchy, to dictator, to aristocracy, to capitalist and finally to the bureaucracy. That transfer is on the road to becoming an accomplished fact and such transfers cannot be reversed. It is rather to return to the established theory that any power should be qualified, restrained and humanized for the sake of the individual for whom it exists.

Liberty in a framework of discipline is our ideal; it is not destruction of the framework that is needed but the definition of human freedom within it. It is a simple but fallacious thesis that the transfer of economic power to the state—that is, the bureaucracy—is in itself a panacea for all economic and social ills of society. The absurdity of such a belief is every day becoming clearer—not because untrammelled state control is intrinsically any worse than untrammelled capitalist or any other species of absolute

rule, but because all absolutism is in its nature inefficient, tyrannical and inhuman. As Lord Acton says: "Absolute power corrupts absolutely." There can be no resurrection of the past or reversal of the present. The remedy is to invoke and apply in the name of individual freedom and conscience those constitutional checks and balances which have always provided an answer to the excesses of concentrated power.

Now, having viewed that new social structure, we, as actuaries, can view better our responsibilities in that structure.

Sometimes in a nostalgic mood we think of Ogden Nash's poem:

Oft, in the stilly night,
When the mind is fumbling fuzzily,
I brood about how little I know,
And know that little so muzzily.
Ere Slumber's chains have bound me,
I think it would suit me nicely,
If I knew one tenth of the little I know,
But knew that tenth precisely.

The Year Book of the Institute of Actuaries tells us: "The function of the actuary in modern civilization has been broadly defined as the application of the theory of probabilities to practical problems." This function has already led our members far afield from the intricate mathematical sophistications based on an imaginary law of mortality that cost many older members their youth spent in long vigils. Today, we find our members expanding the knowledge and use of the theory of probabilities to possible solutions of many social and personal anxieties and perplexities.

In industry and commerce we find them dealing with retirement and pension plans.

In the broad field of social knowledge we find many new and fascinating problems for actuaries. These lead away from the ideas of individually calculated premiums and reserves to regions where income and outgo depend on such factors as wage levels, the flow of population as to age groups, fertility, immigration, and so on.

Amid the *débris* of past wars and the threat of future wars we find problems of manpower, fitness, aptitudes and others to which the theory of probabilities is being applied by actuaries.

Then, too, an increasing number of our members have found that their actuarial knowledge can be applied to the problems of management.

All these are signs that the actuary is giving thought to the dynamic social structure of which he is himself a unit; to the desires, the stimuli and the conditions which influence the rise and fall of birth rates and death rates; to the yields and hazards of investments; to the changes in values

brought about by booms, depressions and the economic wastes of wars; and, above all, to that essence of all management . . . human relations.

However, they are but milestones on the road on which we cannot avoid traveling . . . the road into the future.

THE FUTURE

Forecasting has kept its place for thousands of years, not because of the accuracy of its predictions but because of its practical necessity. It must necessarily be based on assumptions regarding the future and to these the theory of probabilities can very well be applied.

Shall we, as professional students of the probabilities of risks, ask ourselves a few questions on the future . . . many more will naturally come to your minds:

1. What would be the role of the actuary under complete socialism? Is not this a possible eventuality and should it not be looked at realistically and with a view to a helpful answer rather than in a reactionary spirit?
2. Where are we being led by our multiplicity of plans for security . . . ordinary, industrial, all sorts of group insurance, retirement plans of all kinds, unemployment and old-age social security, aid for children and others, compulsory accident and sickness benefits, etc.? . . . As actuaries, who have done much to establish on sound bases each individual plan, do we not have the responsibility of surveying the whole complex conglomeration, pointing out the conflicts and contrasts, and attempting to coordinate it?
3. Having made assumptions of interest rates in our premium calculations, should we not be vitally interested in the future of the principal and earnings of investments in a world of Keynesian theories and controlled economies?

CONCLUSION

Throughout the ages some men have bemoaned pending disaster and have cried that there were no new frontiers to conquer; that everything should be divided rather than multiplied; that the fundamental laws of supply and demand no longer asserted their timeless ascendancy.

Have they forgotten so soon:

The primitive man who found the fire of the sun?

Those early ones who substituted facts for appearances?

That there is no adequate defense, except stupidity, against the impact of a sound idea?

And now man has discovered the power of the sun . . . atomic fission . . . by experimentation, as primitive man discovered the light of the sun.

Shall we cringe before this power as cave man cringed before the light?

The answer must be a resounding No! It is only another problem to solve.

Today we live . . . the past is only a pattern to give us experience.

Today, we stand on the threshold of the future . . . as has every man on every day since time began. The future we face calls for widening responsibilities, suggesting that we keep always in mind the Chinese proverb: "To fish in the stream of life we need wisdom as a bait."

Tomorrow is resplendent with golden opportunity. The problems ahead are not beyond the scope of the human mind if we face them courageously. The frontiers of mind and heart are endless. We can . . . we must . . . find the way forward . . . as free men, unafraid . . . on the journey to the endless horizon.