THE PRESENTATION
OF
A RAMBLE THROUGH THE ACTUARIAL COUNTRYSIDE

The Collected Papers, Essays and Speeches of Frank Mitchell Redington

ON 20 May 1986 the Society held a meeting to celebrate the publication of A Ramble through the Actuarial Countryside: The Collected Papers, Essays and Speeches of Frank Mitchell Redington. This work had been commissioned by the Society in 1982 and is edited with a commentary by Gary Chamberlin.

Five senior members of the profession were invited to speak on different aspects of Frank Redington’s contribution to actuarial knowledge. The meeting was closed by the book’s editor, Gary Chamberlin.

BERNARD BENJAMIN on MORTALITY

The volume is a splendid and impressive one. It represents the only kind of immortality that I can believe in and as far as I understand him the only kind of immortality that Frank Redington believed in. The editor, Gary Chamberlin, has performed his task with great skill and sensitivity. The subject arrangement and the Chapter titles give an attractive coherence to the volume and his own editorial remarks show deep understanding both of the Redington papers and of the man himself. They represent good writing in themselves. I shall later make one small criticism, but that does not detract from my praise.

The volume is a large one and no one person could possibly attempt to cover more than a small fraction. So I am glad that I can, and indeed have been so instructed to leave to others more qualified than myself the task of appraising Frank’s thoughts on the subject of life office valuations and associated subjects and on Pensions, and confine myself to the subject on which he and I had most conversation, namely mortality.

Frank and I were very much in close contact at the time when he was preparing his paper(1) on ‘An Exploration into Patterns of Mortality’. I was trying to get him to comment on the final draft of Benjamin and Haycocks.(2) Bert Haycocks had died soon after drafting had begun and I felt a bit insecure. However, understandably, Frank was too keen to get on with the exploration to suffer the distraction and the tedium of looking at exposed-to-risk formulae, an aspect of actuarial work in which he was never very interested although in his younger days he was a superb teacher of the subject. But fate intervened to prevent my oppressing him. He had a stroke. When next I received a letter it was about the exploration and he claimed, with almost boyish excitement, “I have written this
letter with my left hand". The writing was quite legible. The thoughts were crystal clear as they would have been even if he had to write with a pencil between his teeth. The correspondence, at least on my side of it, had amongst other things to do with two difficulties, which I mention not as a criticism of Frank, but as an illustration of his personality.

The first was Frank's reluctance to read too much of what other authors in the field were doing. This was not arrogance, it was just that when Frank was in the chase for truth he could not spare much time to read of other chases. So if I said to him, "Wait a minute, that is not altogether new", he would call back from further along the road, "But I am here now". I did make a mild remonstrance in closing the discussion on the paper(1) when I accused Frank of being selective in his biological readings. For Hayflick on whom Frank placed much of his reliance, apart from Alex Comfort to whom I called his attention, was only one of the number of scientists then currently developing theories of ageing and even then his theory was coming under some criticism. I think the first part of the exploration would have been better left unpublished and could without loss have been omitted from this collection of papers. I found it a mathematical exercise, not obviously connected to the later, far more exciting and far from mechanical 'A Physiological Limit to Life'. Frank admitted in paragraph 2.2 and 2.3 of part I of the paper that we, namely Beard, Clarke and myself, thought part I only a stepping stone and he agreed that it was "long and tedious" at that, to quote his actual words. In the event, many readers, I believe, for this reason found it a difficult paper to get into and as a result the discussion was restricted. Frank was a bit upset by this and his irritation was betrayed in his immediate remarks which were concentrated on part I. But, of course, he put it all right in his final written contribution.

Looking back and naturally a victim of my own predilections, I regard part II of this 1969 paper(1) as one of Frank Redington's most important and most philosophical of all his papers. Read again paragraphs 28.1 and 28.2. They may appear to be simple, but to me they are very imaginative and profound. Frank could outpace anyone in developing an idea, but he led those that cared to follow and I for one owe him a tremendous debt for indicating the way ahead.

The other trait of Frank Redington which has seemed to me to be peculiarly his is the habit of using, in the same paragraph, the same words in different senses, for example, the use of expectations in paragraph 1.3 of the 1969 paper. Expectation of life has a strictly statistical meaning, namely the arithmetical mean, but Frank adds "while there is life there is expectation". This is a different meaning although a very profound one. He also had a penchant for unusual words, for example, there is the use of the term angle instead of the third differential of the curve of deaths. It is not actually an angle, but a bend and to some extent it misled me. At one time he fell in love with the word aleatory in preference to chance. An aleator is a die thrower. I argued with him that it was natural to fall in love with words, but not helpful in scientific paper. He smiled, looked into the distance and then nodded, but without conviction. It was not easy
to argue with Frank. You were up against a combination of genius, obstinacy and, not the least, charm. An unbeatable combination.

Before I leave the exploration I must answer the Editor, who had chosen to describe me as being disappointingly an agnostic about the limit of life. Yes, I am agnostic, I do not know, I still see through a glass darkly. I do not know because I do not yet understand the process of death. I know something of the mechanics of death of a diseased person. I do not know enough about the genesis of disease and the relationship between disease and the increasing mortality. It is a programme of research in this field which occupies me now. I have for this excitement of my own chase a heavy debt of gratitude to the exploration paper; it was a provoking paper. It provoked me into reviving my interest in the interaction of morbidity and mortality which I first referred to in my 1957 paper(3) on morbidity. I still do not know enough about fatal illness, the why and the when. It is my own ignorance that has led me to want to promote much more medico-actuarial collaboration than we have had in the past. Already under the joint auspices of the Institute and the Assurance Medical Society we have had a very successful, in fact over-subscribed, medico-actuarial seminar and I am hopeful that soon we shall have the resources to support a unit in which a medical practitioner and an actuary will be working together, informing each other; jointly endeavouring to push forward the frontiers of knowledge and hopefully to remove my agnosticism.

So where are we now? In 1969, Frank’s calculations led him to stress the existence of a physiological barrier to the extension of life. My 1982 paper(4) was intended to demonstrate that there was not necessarily a limit to this extension. I think that Frank’s contribution to the discussion of that paper meant that he agreed. Equally, I agree with his 1969 statement that progress must be squeezed forward, as he put it so colourfully. Finally on this particular subject I owe Gary Chamberlin another acknowledgement. In referring to my work he heads the paragraph ‘Mortality on the Move’. I like that and I am going to use it as the title of a book on mortality forecasting methods which amongst other tasks occupies me at present.

Before I sit down and without treading on Sydney Benjamin’s toes, I would like to say just a very quick word about ‘Last Reflections’ simply to underline my feeling that we should leave, when we come to it, the last word with nescience or perhaps with science, natural science, a wide wide field of exploration within which a hundred years ago, the Royal Society used to include Actuarial Science. If they were still aware of that, I am sure that we should be remembering to-day a Fellow of the Royal Society.

GORDON BAYLEY on VALUATION and IMMUNIZATION

It is an honour to join in this celebrating of the publication of Gary’s admirable work. It is a particular pleasure for me too, because I had the good fortune to
enjoy many contracts with Frank over the years. When you come to read the book, you could be excused for thinking we were always at loggerheads. On the contrary, I worked closely with him on National Pensions at the end of the fifties, and between his 1972 and 1977 lectures on 'Words and Numbers' we corresponded at length on the subjects of savings and investment. There were many other exchanges between us but alas my brief confines me to the two subjects which were controversial some years ago, namely valuation and immunization.

All Frank’s work, of course, is laced with flashes of insight and wit, but two passages particularly appeal to me at this moment. The first (on page 388) is in closing the discussion on Cox and Storr-Best in 1962:(5) “... an occasion”, he said, “when we might look backwards, for our generation of actuaries is entitled to write ‘finis’ at the end of some of the chapters which have been puzzling us for some time.” Well, I reckon I would have written ‘finis’ to all that has ever been said about valuation and immunization; and, with Redingtonian authority, I could easily conclude my contribution there. That is my excuse if, in continuing, I stray onto the pitches of my colleagues.

The other passage which charmed me appears on page 492 in the second paragraph of his 1982 essay ‘The Phase of Transition’(6) where Frank recalls his discomfort on re-reading his 1952 paper on the principles of valuation and his wish to re-edit it. So, I went back and re-read the responding paper which Perks and I wrote on immunization some months later.(7) In all honesty, bits of it were smashing, bang up to date in 1986. But, as with Frank, embarrassment struck when I recognized the bits I was responsible for drafting.

Dealing first then with valuations, we must distinguish, as Frank always did, between bonus distributions and solvency. For many years I have used both bonus reserve and net premium valuations, but to answer different questions. In so doing I have acquired, I think, Frank's deep respect for the net premium method. His fundamental benchmark was the revenue surplus produced by a passive valuation standard and he never relaxed his commitment to it. He once said it would make more sense to start with a passive gross premium valuation in the conditions at issue for all existing policies and modern data processing facilities would no doubt have given him the chance. But in his hands the net premium method served him well, at least for reversionary bonus purposes. In later years you seem him joining the search for handling high equity content in the assets side of the valuation balance sheet and it led him uneasily in two directions. The first was a search for a passive valuation of equities, comparable say, with amortized values of low coupon redeemable stocks. The second was to seek better valuation control over terminal bonuses. It is sad he did not survive to join in the discussion on Smaller's paper a year ago(8) to help us further forward in both these directions.

A word now about a very different net premium valuation, namely for solvency purposes, or as many of us including Frank would say, for 'adequacy' to meet policyholders' expectations. His devastating criticism of the system
prescribed by our valuation regulations can be read on page 483 on the discussion of the 1975 paper\(^{(9)}\) by the Bews group. He has not, of course, been its only critic, but I have searched in vain for his guidance on what to put in its place as a trigger mechanism that would be practicable in the present state of our art. We are now stuck with what we have got, and one important company has just fallen foul of it. So what are the lessons, and where was he pointing us from here? Well again I see more than one direction ahead. One is signposted to public relations, particularly with policyholders and agents. Along that road we see banners being carried by Messrs Macharg, Short, Iqbal\(^{(29)}\) and several other contributors all discrediting the tyranny of bonus projections. And we hear voices along the sidewalks arguing about the strength of our respective companies. We should, I think, heed Jewell’s plea in the discussion last year,\(^{(10)}\) find the way to the best answers, and then communicate them ourselves with a clarity Frank would have brought to bear in his time. If we do not, others will make the attempt and probably get them wrong.

Another road ahead leads to more investigation into solvency standards and I wish very much we could have discussed with Redington himself his unpublished essay on ‘Prescience and Nescience’ to which Bernard Benjamin referred, that comes at the end of Gary’s collection. He was right to remind us, as he does there, that forward projections of cash flows tell us much more than their compression into capitalized present values. Projected revenue accounts can be used, and indeed are used, to analyse the effects of different strategies for new business and investment, and provide early warnings of possible problems ahead. Indeed over 25 years ago, Sidney Benjamin applied the theory of games to the investment and disinvestment of future cash flows\(^{(11)}\) and got some support for its application in testing solvency. Perhaps that could lead us to more refined methods of calculating mismatching reserves. For all that, present values have one great merit. In reaching to-day’s decisions they give appropriate weight to £\(_x\) in 1987 relative to the same amount \(n\) years further on. Which brings me finally to immunization theory.

The 30 years that have lapsed since our original controversy have left me unrepentant in claiming that paid-up immunization was and is a more useful model than total immunization in uniform interest rate conditions for two main reasons. It assumes each successive premium is invested, I think realistically, in the market conditions prevailing at the time it is received, not what they were when the contract started. Secondly, for most growing or stationary funds investments just do not exist which are long enough to immunize the liabilities totally. Frank’s musical keyboard analogy reproduced on page 130 again shows how his thinking developed subsequently, and certainty reconciled our differences for me, provided, as I once told him, PUP immunization was middle C.

The immunization issue still has practical significance when we come to measure asset shares, the final valuation process and control in seeking to dispense justice through terminal bonuses. Time prevents me now elaborating how and why, but the particular choice of immunization model for the
guaranteed part of a contract was implicit in some of the discussion on bonus
systems in this hall a year ago.\(^{(10)}\) Further work on asset shares, equity backing
ratios and terminal bonus contents would greatly help appointed actuaries and
investment managers to formulate more clearly what their companies are doing
with their left and right hands. I believe it can strengthen them both in resisting
the liberties that are being taken with the terminal bonus system and the writing-
up of asset values.

I have read the book from cover to cover, twice in fact. Once to indulge in
nostalgia, and then to try and perceive some of the ways ahead that Frank would
approve. I have enjoyed both.

**RONALD SKERMAN on BONUS DISTRIBUTION**

I offer my warmest congratulations and my gratitude to the Students' Society
and in particular Gary Chamberlin and the others most closely involved on the
preparation and publication of this book. It provides a unique record of Frank's
works and reflects how he led and stimulated actuarial thinking. It has a
particular value for me because it will be of great value in recalling the
enlightenment which I received from Frank over the many enjoyable years
during which I worked closely with him.

I will attempt to outline the development of Frank's thoughts on bonus
distribution over the period from the 1930s until the presentation in 1981 of his
paper 'The Flock and The Sheep and other Essays'.\(^{(12)}\) These views developed
against the background of historically large changes in the rate of return on
assets, with an increasing proportion of that return being derived from equity
dividends and capital appreciation. Although Frank was a pioneer in proposing
solutions to the emerging problems, his writings and speeches suggest that he felt
that the profession was confronted by more unsolved problems in 1981 than
when he presented his 1952 paper.\(^{(13)}\) In 1952 there seemed to be a faint hope of
building a model which would co-ordinate the length of term of the assets and
liabilities with the bonus declarations so that one could arrive at bonuses by a
theoretical mathematical process, but in fact the development of the thinking of
Frank and of others since then on bonus distribution has been largely pragmatic.
Frank said that the 1981 paper raised questions but gave no answers, and at the
end of his written contribution closing the discussion on that paper in Edinburgh,
he said there was plenty of scope for exploration, and I am quite sure that remains
true. I will try to indicate how he described the problems which he bequeathed to
the profession in the hope that this will stimulate constructive proposals for
solutions.

When he described the pre-war situation in the 1981 paper, he did not question
the suitability of the uniform reversionary bonus system, but he criticized what
he considered was an unduly high level of surplus distributed then. In his 1952
paper he again accepted that the reversionary bonus system was a suitable means
of distributing surplus. Early thinking on the subject of 'The Flock and The Sheep' is indicated when he discussed the effect of a change in the rate of interest on business in an immunized fund. He said that it would theoretically be reasonable either to change with-profit premiums, or to leave them unchanged while differentiating bonuses. He went on, however, to introduce practical considerations by saying that bonus declarations should be simple and such as to commend themselves to the policyholder, that differentiating bonuses according to the rate of interest ruling at the date of issue would not be understood, and that wider grounds for uniformity in bonus declarations overrode mathematical grounds for differentiation.

In 1957 in the discussion of my paper on overseas business, Frank blessed the idea of separate premiums and bonuses for overseas business within a single fund. In 1957 in the discussion of a paper by Anderson and Binns on 'Equity Appreciation and the Uniform Bonus System', he envisaged departures from the uniform reversionary bonus system saying that items in surplus not properly distributed by that system would fulfil three conditions—that they were sufficiently large, that they were always in one direction and that their incidence was widely different from the uniform reversionary system. In 1958, in his Presidential Address, he commended the reversionary bonus system, though with a number of variations or refinements, as being simple, economical and intelligible to the public, while at the same time expressing some concern about the effects of persistent inflation which had by then assumed greater importance. In 1959 in the discussion on Benz's paper 'Some Notes on Bonus Distribution by Life Offices', he dismissed as evanescent capital appreciation due to bullish sentiment on the Stock Exchange, but said that the increase in equity income which was then emerging clearly belonged more to the older policyholders. He envisaged in the future the immediate writing-up of assets to increase surplus to reflect an increase in the public estimation of the value of future dividends and he also envisaged special bonuses on claims. In the national report written in conjunction with John Young for the 1968 Munich Congress, it was recorded that in the light of increases in equity dividends in 1954 and 1955 three substantial offices had broken with tradition by declaring an additional bonus (one of these was his own office). The report recommended containing normal bonuses at reasonable levels and being liberal with special bonuses for older policyholders. In the previously unpublished 1983 paper, The Rebirth of Terminal Bonuses, Frank outlines the history of the introduction of terminal bonuses, initially called final bonuses, in his own office in the declaration for the year 1956. Although he attributes this to the rise in equity values, he explains that the only surplus then used for terminal bonuses was increased equity dividends and that there was at that time no thought of augmenting surplus by writing up asset values. For 1964, terminal bonuses in his office included a contribution from writing-up for the first time and terminal replaced final as a description of these bonuses in 1967, and subsequently.

I feel very much at home with Frank's last paper, The Flock and The
Sheep', because in it Frank asks searching questions needing answers and this is the treatment I often faced at his hands. When reviewing the past, in that paper, he indicated several problems which confronted the profession and how they had arisen. I will try to describe those problems and summarize Frank's comments relevant to them. First, should with-profit premiums be changed in the light of changing views on future experience? Frank said that the actuarial attitude, that they should be left unchanged, was not thoughtful and high-principled, but quixotic. He was particularly concerned with the tendency to increase them when the future looked less favourable, but never to reduce them. Second, can guidelines be developed to define an acceptable bonus system from the point of view of the policyholder? Frank said that there is no tolerable measure of equity between policyholders, but that bonus systems should be simple and commend themselves to them. It is interesting that this is a repetition of what he said in 1952. Third, how should bonus illustrations be presented? Gordon Bayley has already touched on this. Frank said, in a very illuminating phrase, that the profession had not learned to live with its salesmen's promises under with profit policies. Fourth, if the present reversionary bonus systems are to continue to be supplemented by terminal bonuses are these systems being operated fairly as between simple, compound and super-compound systems? He had in mind, of course, that some offices were developing some extremely steep super-compound reversionary bonus systems and to add large terminal bonuses to them at long durations could raise expectations bordering on the fantastic. Frank said that this problem should be faced before attempting to arrive at a suitable system of terminal bonuses. Fifth, should the present reversionary bonus system be abandoned in favour of a system which distributes surplus in relation to reserves? This question was raised by Ferguson in the Institute discussion on Frank's 1981 paper. A solution could, for example, lie with recurrent single and possibly variable premium contracts, where the premium basis includes an interest margin. Sixth, can a position be defined, if not generally then by each office, as to the extent to which equities should be written-up to increase surplus and as to how the benefits of writing-up should be shared between policyholders? Frank said there was nothing in his experience comparable, in magnitude or in ability for unlimited growth, to asset margins arising from the reverse yield gap. This created a greater problem of quantifying surplus than of its distribution. He advanced the concept that free reserves attached to an individual policyholder and that the accumulated contributions which he had made thereto should be returned when a claim arose. He identified two extremes as regards writing-up. First, to act quickly and augment surplus as much as possible and increase reversionary bonuses. Second, to take the latest possible action and write up only to provide terminal bonuses on claims. The second course would leave a large buffer which would encourage liberality.

Frank did more than his fair share in solving problems of bonus distribution which arose during his active professional life. He rendered further service in defining the outstanding problems. Can we rise to the challenge? Far from trying
to do so now, I would like to demonstrate that I have learnt from Frank by adding two questions of my own which I think need answering before we attempt Frank’s examination paper. The first one amplifies the last of Frank’s questions to which I referred, which is the extent to which changes in asset values should be reflected in terminal bonuses. I would amplify this by asking how should the consequences of the various factors causing these changes be treated, i.e. changes in dividend rates, in expectations as to future earnings, in investment sentiment and in the relative supply of and demand for investments and also in the rate of interest? The answer to those questions need not be the same for all offices, but each office should define and know its own policy. My second question is, to what extent should a new money approach be adopted? Following on from this, should such a policy, if adopted, be related to new money rates at the inception of each policy? This is relevant to Frank’s question on changing with-profit premiums when the future experience seems likely to change. Alternatively, should the new money policy be related to new money rates on the dates on which each premium is paid? This has, I think, some relevance to the Perks/Bayley approach on immunization. (7)

Can I end by simply saying that the scope for future paper writers is great?

STEWART LYON on NATIONAL PENSIONS

I would like to join other speakers in paying tribute to the work of Gary Chamberlin in bringing this book to publication. It really was a mammoth task and I doubt whether anyone else in this room would have had the courage to take it on. He has done it supremely well.

Frank was involved in the National Pensions issue in two major periods, but each time in quite different capacities. The first occasion was before and during his Institute presidency. Here his contributions were the point of view of the profession. During that period, let us say between 1957 and 1960, we could look back on the paper that Bernard Benjamin and others produced in 1954(21) on ‘The Growth of Pension Rights and their Impact on the National Economy’. In a way that was the starting point of the profession’s involvement. Then in 1957 there was the publication of the Labour Party’s paper on ‘National Superannuation’. In 1958 came a Government White Paper, (22) the Boyd-Carpenter White Paper, ‘Provision for Old Age’, which presaged the graduated scheme brought in by the 1959 National Insurance Act which came into force in 1961. In the middle of this there was Frank’s own Presidential Address, in October 1958, (16) two weeks after the publication of the Boyd-Carpenter White Paper. This caused him, as is pointed out, radically to change his address, and also led to much involvement by the profession during that period. Then there was the Biennial Dinner in November 1959.

The second period was from 1962 to 1967 at the Life Offices Association (LOA). Frank was Chairman of the National Pensions Joint Committee of the
LOA and Association of Scottish Life Offices (ASLO) from 1963 to 1967. During that period the graduated scheme introduced by the Boyd-Carpenter Act was extended in 1963, and extended again by the introduction of short term sickness, widowhood and unemployment benefits in 1966. The Labour Party updated their National Superannuation proposals in a publication called ‘New Frontiers for Social Security’ in April 1963. The Conservative Party came out in opposition favouring compulsory occupational schemes with a State back-stop scheme in 1965. When Frank ceased to be Chairman of the National Pensions Joint Committee, largely I think because of ill health, we were still awaiting the Crossman White Paper.

There were three conflicting issues highlighted at that time. I am putting them in the way that Frank put them in one of his notes. Firstly, the public demand for earnings related pensions had been aroused by the private sector, but it was difficult to satisfy it quickly enough or completely enough through the private sector acting on its own. Secondly, the very slow maturity of state pay-as-you-go financing, that is the financing rather than the benefits, with consequent lack of political discipline, and thirdly, the shock to the economy of sudden compulsory funding and doubt about its efficacy.

Just before Frank became President there was a debate here, on 24 March 1958, on the effect of the extension of National Pensions. The debate was opened by Gordon Bayley. Gordon said it is reasonable to start from the assumption that any Government of the day would emphatically prefer to have widespread and successful contracting-out. The question is “How?” and that was the question that was exercising all our minds during that decade. He also said, I think by reference to public aspirations, that the actuary’s deep seated concern for sound finance should not be mistaken for a lack of humanity towards old people. Bob Kirton, who was the Chairman of the LOA/ASLO National Pensions Committee, said he could see a number of solutions whereby the State Scheme could be extended and whereby the private sector on its own initiative could cover an evergrowing proportion of the population, but there was a great puzzle: how to cover the casual labourer? And there, really, in those quotations, you had the kernels of the problem. There was much activity at Staple Inn in 1958 and 1959 with memoranda to the Minister and a brochure on an appeal to statesmanship, which you can read in the book.

What I want to do though is to fill out a little of the detail of Frank’s Chairmanship of the LOA/ASLO National Pensions Joint Committee, which is not on the record and I must thank Barry Sherlock for giving me permission to quote from some of the files. Frank’s involvement in the National Pensions Joint Committee came in 1962 when he was asked to head up the Working Party of what were described as ‘younger actuaries’ who might have to face some of the problems of a development of National Pensions when they became senior executives. Well that party of ‘younger actuaries’ numbered six, and three of us became Presidents, either of the Institute or the Faculty. There was Max Thornton and Joe Macharg, the present President of the Faculty, amongst that
group. It was a fascinating time working under Frank's Chairmanship. We produced a report in September 1962, and the report was very much Frank's authorship: "We do not feel that the country will accept the theme that the area for the State should be confined to basic needs. We do not think that the private sector can first arouse and then satisfy public demand quickly enough or completely enough to forestall further State intervention. In particular the almost complete absence of preservation is a basic weakness of the present situation"—and of course it was in those days. We looked at the possibility of compulsory pensions, this was in 1962 money purchase style. Another quotation: "There are a great number of private organizations who would wish to become approved insurers and eligible for meeting such a statutory obligation, insurance companies, self-administered schemes, professional bodies, trade unions, etc."—no mention of building societies. "This greatly extended multiplication of effort does not seem desirable in the national interest. Further the State can hardly give all these organizations the responsibility of filling a statutory obligation without taking some steps to ensure that they are fit to shoulder this responsibility. Some State control over the private sector seems inevitable and it might well extend to such aspects as solvency, investment of funds, commission terms, margins of profits, etc." Prophetic words.

In 1965 Frank wrote a note to the National Pensions Joint Committee in which he said that it is true that three-quarters of employed males are already in an occupational pension scheme of some form or another, but it is doubted whether ten per cent of employers have a scheme. The so-far uncovered section of employers includes the great majority of small shopkeepers, farmers, builders, garage proprietors, etc. In addition, there are the floating population of self-employed, casual labourers, entertainers, barrow boys, etc. One hesitates to use the word impossible, but there must be the gravest doubts whether it is feasible for the private sector to undertake genuine private schemes for all these people. Industry-wide schemes could be introduced, but negotiations between the bodies representing the parties concerned with such proposals are usually very protracted and special problems arise.

But as I said, the main burden of the debate during those years was how to contract-out of a State Scheme. Frank, drawing on the experience of the professional bodies in the 1950s, summarized the rules as follows: "Any State Scheme is bound to contain a redistributive element and therefore a measure of taxation and subsidy. It is not feasible to give individuals or employers the option of contracting-out of a tax. All persons should therefore pay the same rate of contribution except that contracting-out of specific entitlements to part of the State Pension should be allowed to return for a corresponding reduction in contribution. The only workable basis for this reduction is that it should be, however broadly, the commercial equivalent of the pension foregone. It follows that the State should not make a retrospective alteration in the bargain."

The main problem seen at that time was the problem of the escalator—how do you contract-out of an escalating pension?—and we did not mean, at that time,
so much indexation of pensions after retirement as the revaluation of earnings during service or the contracting-out of a final salary, final notional salary type scheme I think Frank called it. "The difficulty", he said, "lies in the price, or rather, in the absence of a price. The bargain having been fixed it should not be altered, therefore the State should meet the escalation." And then curiously, in April 1963, in what I think was going up a blind alley, "... as a corollary the private sector should invest its contracted-out liabilities in Government securities so the Government is compensated by the drop in the real value of its indebtedness". But as the debate became increasingly more rapid with both political parties in the middle sixties, it developed into a discussion of what was called 'abatement'. In other words, not contracting-out of a whole benefit, but having discrete reductions in the State pension, different categories of special membership. And this was a runner for quite some time. There was even a suggestion taken quite seriously that the Boyd-Carpenter graduated scheme might be converted on to that basis in 1966, when it was extended to include sickness and unemployment benefits. But then we reached the point where we really had to move forward from discrete reductions in benefit. This brings me to my next quotation. In December 1964, Frank said to the National Pensions Committee, "The abatement of pensions and the abatement of contributions must both be flat or they must both be wage related. To what extent wage related abatement of pensions is feasible I do not know; it will be one of our important questions to the experts." Well, of course, what we have now is a wage related abatement of pensions. Work was done on that in the last two years of Frank's Chairmanship. Indeed, he set up a Working Party which reported to the first meeting after he ceased to be in the chair. He was due to be in the chair, but he was absent in 1967 through ill health. I would just like to read a few words from this report—really his last message to the NPJC on this subject: "It is impossible to make one generation pay both for current retired persons and at the same time pay in advance for its own old age. We have been driven to the abatement solution because we could not find a reasonable general solution to contracting-out. The essence of the problem is that it is unreasonable to confine the State Scheme, or the State obligation, within ordinary commercial principles". In summary the contracting-out must be on commercial principles, but you cannot tie the State down in this way. "There is however a major problem which the abatement system does not touch", he said. "It may solve the problem of the inter-relation between the State and the private sector, but it contains no answer, and particularly, no discipline about what the State does. The core of this dilemma is whether the State, if it promises wage-related benefits in the future, should fund or not. Either answer is unattractive. To give the promise and leave the future to pay is quite unprincipled. To fund on paper is spurious. To fund in real terms is difficult and leads to extension of State interference in investment generally. This is a serious problem and it is one which most of the civilized world is having to face."

Some of these quotations may put a little flesh on the bones of the paper
entitled ‘Last Reflections: Reminiscences about National Pensions’. That was written because I wanted to interview him on behalf of Professor Hannah who was writing a book called ‘Inventing Retirement’. In preparation for that meeting, which I had with him at his home not many weeks before his death, he wrote this note on reminiscences. I think when you read it you should interpret it in that light.

**SIDNEY BENJAMIN on LAST REFLECTIONS**

This is a beautiful book and I would like to congratulate the Students’ Society and Gary Chamberlin on its production.

I started my actuarial career under Frank Redington and I had the fantastic good fortune to have had many private conversations with him whilst I was a young man. He showed me the intellectual excitement which can be found inside actuarial work. In keeping with that relationship I am going to concentrate on his last unpublished essay in the book entitled ‘Prescience and Nescience’.

We cannot foresee the future, in particular the financial future. What happens to our techniques if we accept that as fundamental? Economists, politicians, banks, governments, have the same problem but the actuary is in a special position. He alone is continually dealing with long-term funds which stretch into the distant future. Now, if challenged, we shy away from saying that we are predicting the future; we say our figures are illustrative, but a non-profit premium rate is not illustrative and when the Year Book says that the actuary must decide on the rate of interest in a valuation it is implying a predictive approach. In fact, when the Council Committee was looking at the draft of the present valuation regulations, it came to the conclusion that the long term rate of interest was not a matter for individual judgement; it had to be a matter of collective professional judgement.

Our present techniques depend heavily on capitalized present values and they in turn depend heavily on a uniform rate of interest, but it is the effect of fluctuations in the rate of interest which causes the problem. Given that the foundation of our techniques is so shaky how is it that we have been so successful? It is largely due to the fact that, for most of our past, financial conditions have been relatively stable with relatively slow changes. So a uniform rate worked whether or not we recognized it was predicted. If we accept that we cannot foresee the future then we must use an approach which is much closer to the approach to pension funding where we say we are homing in on a moving target. “Homing in must be the basis of our approach”, says Frank Redington. One reason why we have been successful in the past is that we have learned not to rely on a single figure, but to pay great attention to the sequence of figures, the sequence of valuation results, so we have been subconsciously aware of homing. Instead of collapsing the future into a single capitalized present value, we need to look at the shape of the emerging future funds and recognize that that shape lies in a widening tunnel, or funnel, of doubt.
FMR obviously remembered vividly the first time he saw the shape of his future funds on a graph with its plus, minus, plus shape over time. He gives a vivid picture of what he has in mind. Think of the shape in time of the fund as if it were drawn on a slide. There is, in fact, an independent variable. For a pension fund it is the contribution rate and for a life fund it is the rate of bonus. We need to change the independent variable and see the change in the time shape of the fund and we need to keep the shape on the slide. This approach means that we look for markers. Valuations imply foreseeing the future. Markers can be calculated retrospectively. The strength of the net premium method of valuation is that a retrospective calculation gives you the same answer as a prospective calculation, but we should call them net premium markers. With modern bonuses and bonus systems, it would make sense to have a bonus reserve marker. The bonuses could be valued, but the premium should be a pure premium for the benefits. The problem with normal bonus reserve valuations is that they do imply foreseeing the future. FMR argues that we have never found a satisfactory way of valuing non-profit assurances and the reason is that they are unreasonable contracts. Perhaps we should stop issuing them, except for very special purposes, and I wonder if FMR intended to include unit linked contracts in this category as well. He thinks that if the ideas in his paper are pursued then he would expect two developments. Firstly, by looking at the time shape of the emerging fund the profession would concentrate on the subject of mismatching. Secondly, by accepting the ideas of nescience and homing, the industry and the resulting authorities would come to realize that the valuation basis itself is not important. It is the interpretation which is important.

So far I have summarized what FMR was saying with my own emphasis. I would now like to attempt a personal extrapolation on his last thoughts. I would like to show that I think our future techniques will recognize that we cannot foresee the future. With the modern hardware and software available most of us are already using projection techniques to produce future cash flows, and some of us are using simulation. We build a model of the process, of interest rates say, and we can simulate it a million times. Each simulation is a future path so we have a million paths and a million answers. What do we do with them? Furthermore, we shall travel only one of those paths. Our first question should be “Have we any control over the process?”—if not, then there is no point in simulating. In practice there is what FMR called the independent variable, it is the contribution rate or the bonus rate or rebate. This means that to make the simulations useful we must insert into each path the decisions we would take if we were travelling along it. So our first future problem is to learn to formalize our decision procedures by which we adjust the control variable or variables available to us. In engineering that is called feedback. Now some of you will not be surprised at the direction in which I am pointing. There is a whole discipline which is now creeping into the actuarial world. It is much younger than the actuarial profession and it is known as control engineering.

Control engineers describe processes by algebraic models, so do we, but theirs
look different. They have also developed a whole formal structure for describing different control or feedback mechanisms. What is particularly exciting is that this formal structure allows them to take the further step of designing control procedures and improving them. The exciting idea of design raises the exciting question of design features. What are the criteria by which we shall judge a better design? Let me ask my actuarial audience a question. Two pension funds have exactly the same experience, they are valued by two different actuaries using different funding methods and bases and you have their complete histories in front of you. My question is, where in actuarial literature could you find discussion on how I could judge one method to have been better than the other? Control engineers accept that unexpected changes will take place. Even if you recognize that a change has taken place you will not know if it is a 'spike' or a 'step'. You would like your control system to ignore a spike and to react quickly to a step change. The engineers tend to judge a control design by the way it reacts to unforeseen changes of different types. To us FMR's phrase they would look at, for instance, how quickly the system homes in to a new level and whether that was the right level. If you want to watch a control engineer at work designing a control system in general insurance and coming up with a surprising answer look at Les Balzer's paper\(^{(26)}\) for which he received the David Halmstad Prize from the Society of Actuaries. An idea has its time and others are now working in this field too. I do not know how much we shall use the detailed techniques of control theory, but I would guess that its ideas will revolutionize our thinking. Let me give an example. If we describe a pension fund by the amount of the fund and the rate of contribution, then we are describing what the engineers would call the 'state' of the system. We can now think of 'driving' the fund from one state to another over a period of time using the intervening contribution rates as the control variable, or what FMR called the independent variable. The engineers have introduced me to ideas such as bang bang control, it is a marvellous name, and minimum energy control. The latter seems to correspond to what might be called the 'smoothest path'. I do not use their algebra, but now that I have the idea I find I can do it, at least in a simple example.

In his essay FMR gives the graphical analogy of aiming to keep a particular picture on the screen as we move along in time. I was introduced to the ideas of control theory by chance when I visited a demonstration at the Cambridge University computer control laboratory. What they were doing was watching on a screen a graphical representation of a control system and adjusting the values of the control parameters according to the changing shape on the screen. Frank Redington would have loved it.

**GARY CHAMBERLIN in closing the presentation**

Thank you all for the very kind remarks that you have made. May I begin by adding my own welcome to Mrs Redington and the Redington's son Peter who
are with us this evening. We are very delighted that you have been able to come and honour us with your presence.

One thing Mrs Redington has told me about Frank is that he never wished to have any kind of memorial service, but his wish was that another paper of his should be discussed at the Institute and that would be his reward. So I am very pleased we have been able to fulfil that wish of Frank’s this evening. My regret is, he has not been here to see the production of the book and to be able to enjoy it as we can. My other regret, as I have mentioned in the introduction, is for my own father who also took a splendid interest in the book for the first three-and-a-half years, but then his own death supervened so he has not seen it in the bound version. He spent his life’s work in the insurance industry and always had the highest regard for the actuarial profession.

One other thing about Frank, which again Mrs Redington has told me, is an ability of his we have not touched on at all this evening. I do not know if any of us knew before, but in his youth he was an excellent athlete and a very good long jumper. Apparently in 1937 he won the long jump in the Prudential sports with a jump of 21 feet which has only fairly recently been bettered. So you might ask whether there is any end to his talents!

In speaking of him tonight, the main thing I would like to say is that the work of completing the book has been its own reward, because one has been able to share in the mind of an extraordinary man. A mind which is acute, expansive and wise. If one wanted to get to the heart of actuarial affairs and to understand the actuarial profession and its skills, what better way than to study with a master of that profession, a master of that tradition? I do share the current discomfiture with some of the text books, and in a way this is an attempt to provide a text book which really does tell the student about the heart of things.

I first encountered Frank in 1975 at Staple Inn when he was speaking in a debate on a paper by Paddy Kennedy and others.(27) As I had only just joined the profession, I well recall sitting in the Hall and failing to understand virtually anything that was said, but nevertheless being impressed by the erudition. But when Frank stood up to speak the atmosphere changed, there was electricity in the air and I suddenly found I was understanding something, and something that seemed to me very important. In fact it was the speech in which he talked of the idea of plus, minus, plus. One of the delights to me in seeing the book in print is that in the final essay he has actually drawn out the graphs of plus, minus, plus for us to see. So it is not just in a speech, it is there in the visual sense as well.

What I would really like to do is to try to give some clue as to his quality of mind. I think you already understand that there is the faculty of reason at work in Redington, but somehow it goes beyond what we normally consider to be the faculty of reason, the rather mechanical process by which we are accustomed to thinking our ideas out. Let me quote from his Presidential Address given in 1958.(16) He says "Come with me for a moment away from the professional workbench and into the night. Let the dazzle of artificial light fade from your eyes. Regard these stars and planets with the gaze of simplicity. To the telescope
they may send a message of inexorable law, but to the natural eye they are a random scatter of wild flowers across the three dimensional meadows of the sky. The ancients may not have suspected the order in the universe, but we with our microscopes and our telescopes and flushed with our triumphs of science may be forgetting the lack of order. The regiments of stars are not regimented. The music of spheres is not the regular hum of the dynamo, nor are the words of the song deterministic. The dominant theme is chance and individuality. It is probability, not certainty." Of course, in the profession we are very much concerned with probability, but how often do our minds expand to that greater picture of what probability is about? That very fundamental part which it plays in every aspect of the life of the universe? It is a view which we do not usually live with, but when we find it we can all appreciate it. We are taken into a much larger space in which to live, a much larger living place for the mind. It is as if there is a faculty of mind which we have somehow forgotten, but which is still available to us when a man such as Frank Redington points it out. So in the end a lot of the encouragement to complete the book came from my regard for Frank as a philosopher. It is the qualities of the philosopher that one finds in his work.

I would like to thank the Students’ Society for the leatherbound copy of the book which will always be a treasured possession. I was very moved when it was presented to me.

I would like to close with another brief quotation which is again that of a philosopher. It is from the ‘Words and Numbers’ essay(28) where Frank talks again about reason, and shows the other side to reason which we sometimes call intuition. But perhaps if we really understood it, we would say it is the same faculty deeper down in our natures. He says “If reason were our only faculty I should be a pessimist, but in fact I am an optimist. We have sharp, non-reasoning intuitions of beauty and goodness and even in the approach to truth itself the reason is secondary to the sharp intuition that something does or does not ring true. Yet I must give reason its due. All my life I have found continual pleasure in the exercise of reason. Always there is a fascinating range of intellectual mountains at the doorstep asking to be climbed. And on the rare occasions when one does reach a summit one never finds that the view which presents itself conflicts with one’s intuition of truth and goodness and beauty.” So it is that greater search for those most excellent qualities which, I think, has propelled this book into existence. I hope that succeeding generations of us in the profession may continue to find truth, goodness and beauty, all three in Frank Redington’s work.

REFERENCES


(22) HMSO (1958) Provision for Old Age: The Future Development of the National Insurance Scheme. *CMND, 538*.


