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PRESIDENTIAL ADDRESS

by

J. J. McCutcheon, M.A., Ph.D., D.Sc.

[Delivered to the Faculty, 5th October, 1992]

There is only one way in which I can possibly begin my Address this evening – and that is by thanking you all most sincerely for electing me your President. I am very conscious of the honour which you have bestowed upon me, particularly when I consider how far removed is my own sphere of work from the mainstream activities of our profession. During my term of office I shall remain very aware of my indebtedness to you all and will do everything in my power to serve the Faculty well.

Throughout my career, from that distant day when I first enrolled as a student of the Faculty to the present time, I have constantly been aware of one of the great strengths of our profession. I refer to the quite remarkable extent to which its members seem prepared at all times, regardless of personal inconvenience or commercial pressures, to trouble themselves to give assistance to a brother or sister actuary. In the nature of things this assistance often takes the form of help or advice from a more senior person to a younger colleague. I have, I suspect, had more than my fair share of such help, but I have, too, on frequent occasions been aided considerably by actuaries of my own age and of younger generations. Looking round the hall this evening, I realise that to acknowledge individually each of you who has assisted me over the years would leave me little time for other matters. Perhaps, therefore, you will accept collectively my heartfelt thanks and at the same time forgive me, if at this point I mention briefly two people to whom I feel especially indebted.

The first is the person who persuaded me to join the actuarial profession. I am referring to our distinguished Past-President, Mr John Young. It was through the good offices of a mutual friend that I was introduced to Mr Young and to this day I retain clear memories of taking afternoon tea with him in an office in Drumsheugh Gardens in the spring of 1962, my final year as an undergraduate. My boldness in venturing from the sheltered confines of my home in Glasgow to the uncertain (and, for all I knew, much rougher) pastures of our capital city was well rewarded! The University careers service had drawn my attention to actuarial work, but only in a vague and imprecise manner. I was, I admit, sceptical – but in the space of only thirty or forty minutes the enthusiasm with which Mr Young described the role of the actuary dispelled my doubts completely. I still remember, among other things, how he assured me that I would find the work not only intellectually satisfying, but also 'exciting', and 'challenging'. How right he was!

If you will allow me to ignore several periods of employment after leaving school and during University vacations selling tickets on the sadly departed vessel, the Renfrew Ferry, the second person to whom I wish to acknowledge my gratitude today may fairly be called my first boss. This was Mr William Lundie, who died earlier this year. It was

he who ensured that the transition from the relatively free lifestyle of an undergraduate to the more disciplined one of an actuarial student was, for me, not too painful. Bill Lundie's concern for the well-being of his actuarial students was legendary. In my own case, his judicious use of both carrot and stick ensured that the hurdles set up by the Faculty's examiners were duly cleared. I remain particularly grateful for his personal interest in my progress as a student and for the considerable trouble he took to ensure that, as far as possible, at all times the work which I did in the office was closely related to the subjects I was studying. I wonder how many of today's employers would be so understanding.

I do not know how common it has been in the past for an incoming President to be given advice, solicited or otherwise, on the subject of his Address. You may be surprised to learn that two of our Fellows have tackled me on the topic. One, having given me a mathematical paper of some intractability, which he had been sent from Bulgaria, subsequently came up to me and said somewhat sternly, "Study the paper I gave you and then tell us all about B-splines.". The other, possibly more aware of my frailties, was even more direct. Taking me to one side, during a lull in a meeting of the Executive Committee of the Continuous Mortality Investigation Bureau, he simply said, "Your Presidential Address – whatever you do, don't moralise!". You will all, I think, be relieved to learn that I have chosen to obey one, and only one, of these two commands. You may also be amazed to learn that lulls do occur at C.M.I. meetings – but only occasionally, I assure you!

Preparing this Address has not been a simple task. This may surprise those of you who realise that one requirement of my day-to-day work is to lecture on a regular basis. However, the nuance which distinguishes a Lecture from an Address is not so subtle and, in any event, most of my lectures generally have a high technical content, which seems to me an inappropriate basis for the majority of my remarks this evening. Nevertheless I have been unable to suppress entirely certain latent instincts which lurk within me. I propose, therefore, to devote the first part of my remarks to a statistical stroll through our membership records. Although I may draw no weighty conclusions, I hope that some of the facts which emerge will be of interest to you.

In collecting together the data upon which my observations are based I have been aided greatly by Mr Mair, our Secretary, and Mrs Elvin, our Assistant Secretary (Education), whose considerable knowledge of the Faculty's affairs was freely made available to me. Our Librarian, Mrs Lewis, also provided valuable assistance and my colleague Dr David Dickson has most kindly helped to produce the graphs which I shall use to illustrate my remarks. I am, too, grateful to those of you who earlier this year troubled to reply to my questionnaire, which was designed to fill in certain gaps in the records. I hasten to reassure you that the use of code numbers means that individual Fellows cannot be identified from the data file in my possession. If, however, anything I say appears to indicate an error in our records, I hope that you will advise the Faculty office appropriately.

I will begin by considering the growth in the size of our Fellowship during the thirty years which have elapsed since I became an actuarial student. Over the first ten years of this period, from the end of 1962 to the end of 1972, the increase was 32%. From 1972 to 1982 the increase was 23% and from the end of 1982 to the present time the increase has been 36%, so that since I became a student our Fellowship has more than doubled in size – the actual increase in numbers since the end of 1962 being 121%, which corresponds to a relatively modest average growth rate over the 30-year period of some 2.7% per annum.

The recent relatively rapid increase in the size of our profession has not, of course, been confined to the United Kingdom alone. While the size of the combined U.K.-based Fellowship of the Faculty and the Institute grew over the 1980s by more than 50%, almost as great rates of expansion were seen during the same period in the U.S.A. and in Canada. In other countries the growth has been even more marked. In Belgium, for example, the 1980s saw a doubling in the size of the profession and in Portugal (where admittedly actuaries had been somewhat thin on the ground) the number more than quadrupled in ten years. (To keep things in perspective, I should perhaps add that – even relative to the size of the country's population – the actuarial profession in Portugal is still relatively small.)

The growth in our Fellowship is illustrated in my first two graphs, which relate to the period from 1955 to the present day. (I have gone back no earlier than 1955 in order to avoid the disruptive effects of the Second World War.) The first graph shows the number of students completing the examinations each year.

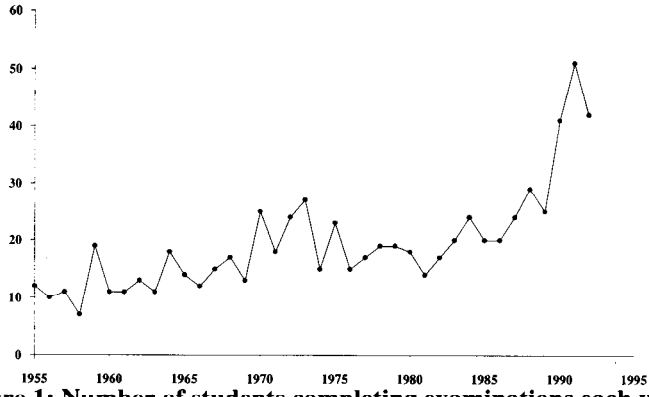

Figure 1: Number of students completing examinations each year
(Note: The figure for 1992 does not include those students who completed the examinations at the autumn diet.)

The smallest number to complete the examinations in any one year was seven (in 1958) and the largest number 51 (in 1991).

An indication of the recent growth in the size of the profession is provided by noting that, while the total number of qualifiers in the 1980s was 211, the three years of the 1990s have so far produced 134 new Fellows.

The second graph shows the number of Fellows at the end of each year.

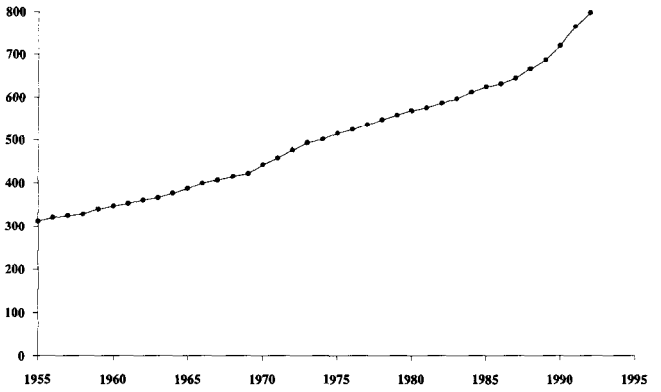

Figure 2: Number of Fellows at end of each year
(Note: The figure for 1992 is the number of Fellows at 31 July.)

Since 1955 the number of Fellows has increased by 157%, from 311 to the current total of 798.

It is of interest to relate the number of Fellows to the number of students. This comparison is illustrated in Figure 3 below, which shows the ratio of Fellows to students at the end of each year since 1955.

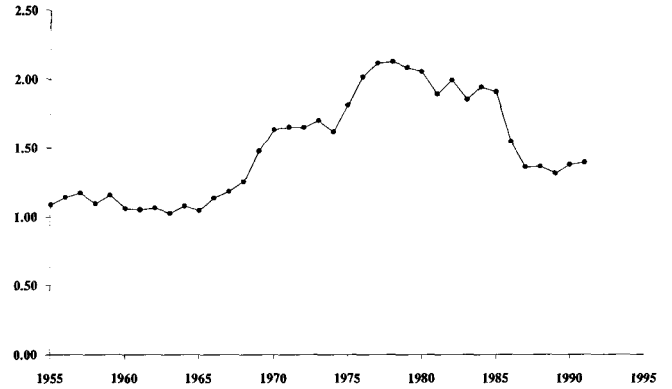

Figure 3: Ratio of Fellows to students at end of each year

During the early 1960s the number of Fellows exceeded the number of students by around 5%. In contrast, throughout the second half of the 1970s we had twice as many Fellows as students – the maximum value of the ratio, 2.12, being attained in 1978. At the end of last year the number of Fellows (766) was 1.39 times the number of students.

The demand for our professional skills remains strong and there is, I think, an increasing awareness of the value of actuarial expertise. While it is therefore reasonable to expect further growth in the size of our profession, there must be some doubt as to whether the relatively high rates of expansion experienced in recent years can be sustained. My personal view is that we shall see more modest growth in the years ahead.

At this point I have a confession to make. I cannot solve 'brain-teasers'. Indeed so great is my inability in this area that the Puzzles Editor of *The Actuary* – or indeed any other magazine – need have no fear of ever hearing from me! It seems only fair to admit this failing, since – in order to illustrate a significant trend – I begin by posing a simple puzzle.

What is the next term in the series {33, 36, 55, 64, ...}? The question is, of course, ill-posed. Since, however, this evening at least, you may wish to humour me, I suspect that – even as I talk – many of you will have come up with one 'obvious' answer, 37, obtained by fitting a cubic polynomial to the given values. At the same time, if you have done this, you will realise that we are playing a game and will not therefore be surprised to be told that you are wrong! The next term is 76 and, in fact, the series in its entirety is {33, 36, 55, 64, 76, 77, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92}.

Now, of course, the penny will be starting to drop! I am talking about calendar years – with the '19' prefix omitted – and the significant point about the series is that each of the last ten years is included. This is particularly pleasing to me, since the years of my series are simply those in which not all our new Fellows have been male.

Fifty-nine years have elapsed since we acquired our first lady Fellow. In the forty subsequent years only three women were admitted! Now our Fellowship includes 34 members of the fair sex. This number is small, but it is growing. I do not belong to the school of thought which maintains that the female mind necessarily possesses insights which mere males lack, but I am convinced that our profession can only benefit – and benefit considerably – by attracting a greater number of young women to its midst. It is encouraging to note that last year some 20% of our new students were women and one might hope that this proportion will increase in future.

Sixty years ago less than 10% of our Fellows were University graduates and thirty years ago the proportion was still less than one third. In the year I qualified fewer than half of those completing the examinations were graduates. Now, of course, it is rare indeed for a new Fellow not to have a degree. This change had occurred in the main by 1980 and is illustrated by my next figure which shows, for five consecutive quinquennia, the percentage of Fellows who were graduates when they qualified.

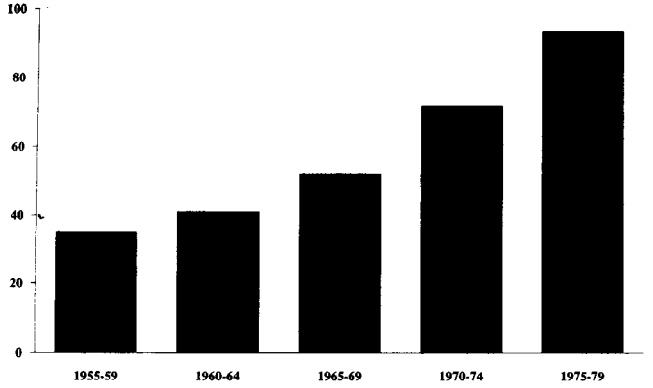

Figure 4: Percentage of new Fellows who were graduates on qualification
(The very small number of Fellows whose graduate status on qualifying is no longer recorded, have been excluded from the calculations.)

For the period 1955-59 only around one third of new Fellows were graduates, for 1965-69 the proportion was one half, and for 1975-79 it was greater than 90%. Only 1% of those qualifying since 1980 have been non-graduates.

The fact that nowadays almost all our new Fellows have a University background is largely a reflection of changes in the patterns of higher education. Nevertheless it prompts me to remark that, in my opinion, it would be a very great pity if we were ever to become a profession restricted entirely to graduate entrants. One does not have to go to University to acquire judgment – or even knowledge – and one does not have to look far to see how valuable is the contribution currently being made to our activities by many who joined the profession directly from school. I hope that we will always be able to accommodate the young man or woman of high mathematical ability who wishes to join the profession without first taking a degree, even although such a person is increasingly likely to be a rarity in future.

During the 30 years from 1960 to 1989 (inclusive) around 80% of the 548 Fellows admitted were graduates and it is perhaps of interest to ask from which Universities our new Fellows have come in recent years. Part of the answer is provided by the table opposite.

Table 1

Number of Fellows who were graduates when admitted: 1960-1989

University	Year of admission as a Fellow			
	1960 to 1969 (135)	**1970 to 1979 (202)**	**1980 to 1989 (211)**	**1960 to 1989 (548)**
Edinburgh	17	43	34	94
Glasgow	9	35	42	86
St. Andrews	5	13	25	43
Heriot-Watt	0	0	38	38
Aberdeen	1	5	10	16
Oxford/Cambridge	8	19	12	39
Other U.K.	4	25	31	60
South Africa [1]	7	16	15	38
Other/Unknown [2]	9	6	1	16
All Universities	60	162	208	430 [3]

Note:

[1] This category includes all Universities in South Africa.

[2] This category comprises 13 graduate Fellows whose University is unknown and three Fellows who are graduates of other Universities.

[3] Eleven Fellows, qualifiers in the 1960s or 1970s, whose graduate status at the time of completing the examinations is unknown, are excluded from the table.

The total number qualifying in each decade is shown in brackets.

Over the period, the Universities of Edinburgh and Glasgow together supplied around 40% of the graduate Fellows. In the 1960s and 1970s more new Fellows were graduates of Edinburgh than of Glasgow, but this position was reversed in the 1980s. The 39 graduates of Oxford and Cambridge were divided almost equally between the two Universities, 20 of them being from Cambridge. Of the 60 graduates from 'other U.K.' Universities, 46 came from Universities outwith Scotland.

At Heriot-Watt, although the department established under the leadership of Professor James Gray was set up in 1972, the necessary planning and 'lead time' meant that the first graduates from the honours degree in Actuarial Mathematics and Statistics did not emerge until 1977. The first Heriot-Watt graduate to become a Fellow was admitted in 1980.

In the 1990s so far our new Fellows have included an average of six or seven Heriot-Watt graduates each year, while the South African Universities together have produced more new Fellows than the combined total from Edinburgh and Glasgow.

Completing the Faculty's examinations does not dampen enthusiasm for study among our Fellows, one of whom (a non-graduate on admission) took two higher degrees some 30 years after becoming a Fellow while another took his first degree a mere 49 years after qualification.

It is of interest to see how the time taken to complete the Faculty's examinations has varied over the years. This is illustrated by my graph, which shows both the mean and median time to qualify by year of qualification for each year since 1955. For these graphs 'time to qualify' has been defined as 'year of qualification minus year of enrolment as a student of the Faculty' – except for the handful of Fellows who enrolled as students before graduating from University and qualified after obtaining their degrees, for whom I have adopted the definition 'year of qualification minus year of graduation', on the assumption that the majority of these Fellows were devoting most of their energies as undergraduates to obtaining their degrees and not to taking professional examinations.

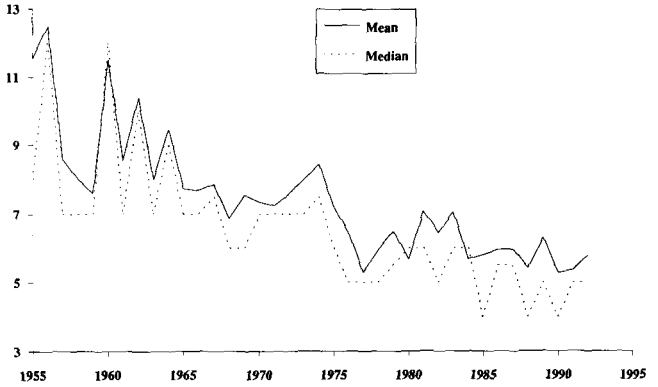

Figure 5: Mean and median times to qualify (years)

Each year since 1984, with one exception, the mean time to qualify has been between five and six years. In only three of the last ten years has the median time been as low as four years.

If, on the basis of the mean time, we were to award a prize collectively to the quickest group to qualify, this would be won by the 41 new Fellows of 1990, whose mean time of 5.3 years pips (by the shortest of short heads) the corresponding figure for the 1977 qualifiers.

The numbers qualifying in any one year are relatively small. Accordingly, when considering in greater detail the distribution of the times to qualify, I have used decennary groupings. The results of my calculations are shown in the table below.

Table 2

Summary statistics for the distribution of times to qualify (years)

Statistic	Decade of qualification		
	1960 to 1969 (135)	**1970 to 1979** (202)	**1980 to 1989** (211)
Mean	8.48	7.05	6.06
Lower decile	4.00	4.00	3.00
Median	8.00	6.00	5.00
Upper decile	13.00	11.40	10.00

(The total number qualifying in each decade is shown in brackets.)

Both the mean and median have dropped significantly with the passage of time, which no doubt reflects the growth in the proportion of graduate entrants. For the 134 Fellows who have qualified in the 1990s so far the mean time to qualify has decreased even further to 5.46 years. One factor which has clearly contributed to this further reduction is the significant increase – to almost 40% of the total in the last three years – in the number of new Fellows who include actuarial mathematics as one of their subjects at University and thereby often obtain exemptions from several of our examinations. For the qualifiers in the 1990s to date the median and lower decile remain unchanged at five years and three years respectively, while the upper decile has come down to nine years.

In each of the past three decades the average age on qualification had a mean value close to 28.5 years. However, for those completing the examinations in the 1990s so far it is almost one year less than this.

If we restrict our attention to those who have completed the examinations in the last 20 years (i.e., in 1973 or later) and note that this period includes all but four of the women who have ever qualified, it is of interest to observe that the mean time to qualify for our lady Fellows (5.7 years) is one half a year less than the corresponding mean for their male contemporaries.

I wish to conclude my statistical study this evening by considering our present position. Currently we have 798 Fellows, of whom – as I have already remarked – 34 are women. The proportion of our Fellows who have retired is almost exactly one sixth, so that the

number now active professionally is 663, of whom 31 are women. Defining 'current age' as '1992 minus calendar year of birth', I have summarised the distribution of our Fellows by current age and geographical location in the following table.

Table 3

Distribution of Fellows by current age and geographical location

Current Age	Location				
	Scotland	Remainder of U.K.	South Africa	Elsewhere	All areas
less than 30	63	12	32	6	113
30 - 39	114	49	6	24	193
40 - 49	109	53	16	30	208
50 - 59	55	18	25	34	132
60 - 69	28	9	16	16	69
70 or more	40	19	8	16	83
All ages	409	160	103	126	798

This shows that 51% of our Fellows are in Scotland, 20% in the remainder of the U.K. and 13% in South Africa. It is interesting to observe that nearly 40% of Fellows are aged less than 40 and that some 30% of our Fellows in South Africa are aged less than 30. The first of these observations is confirmed by my next figure, which shows – separately for all Fellows and for active Fellows – the current numbers in decennary age-groups.

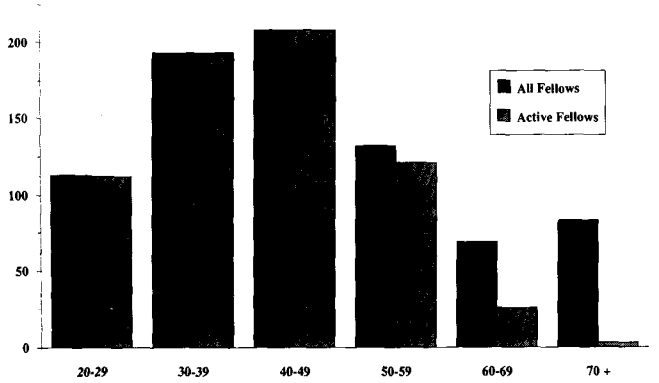

Figure 6: Number of Fellows at different ages

Summary statistics of the age distributions for all Fellows and for active Fellows are contained in the following table.

Table 4

Summary Statistics for the age distribution of Fellows

Statistic	All Fellows (798)	Active Fellows (663)
Mean	46.12	41.03
Lower quartile	33	32
Median	44	41
Upper quartile	55	49

In relation to our active Fellows, when I add that the average age for males exceeds the overall mean by 0.9%, those of you sufficiently lacking in gallantry to perform the relevant calculations may confirm that the average age of our ladies is indeed extremely low.

How long have our Fellows been qualified? Defining 'time since qualification' as '1992 minus calendar year of qualification', I illustrate in Figure 7 below, separately for males and for females and using quinary groupings, the times since qualification of our active Fellows.

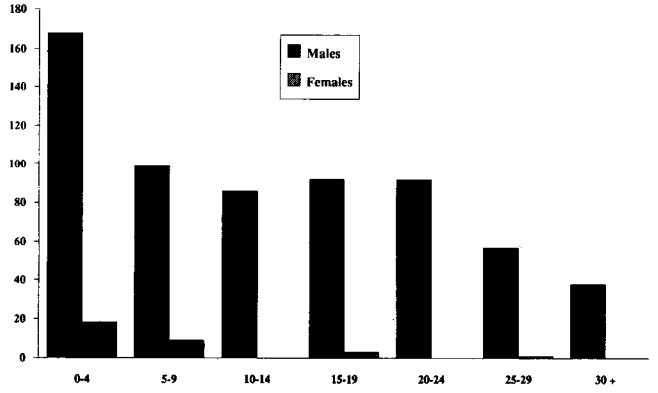

Figure 7: Distribution of times since qualification (years) for active Fellows

The figures in the next table confirm that one quarter of our active lady Fellows have been qualified for one year or less.

Table 5

Summary statistics for the distribution of times since qualification (years)

Statistic	All Fellows (798)	Active Males (632)	Active Females (31)
Mean	17.7	13.4	5.5
Lower quartile	5	4	1
Median	16	13	3
Upper quartile	27	21	8

My final table classifies our active Fellows by geographical location and type of work.

Table 6

Distribution of active Fellows by location and type of work

Location	Type of Work			
	Life Office	Consultants[1]	Other[2]	All Categories of work
Scotland	281	41	23	345
Remainder of U.K.	17	67	48	132
South Africa	38	15	33	86
Elsewhere	35	35	30	100
All areas	371	158	134	663

Note:

(1) This category 'consultants' comprises consulting actuaries and pensions consultants.

(2) The category 'other' includes 44 Fellows whose current occupation is not recorded. Of these, two are in Scotland, eight in the remainder of the U.K., 23 in South Africa, and 11 elsewhere.

The proportions in each location are virtually identical to the corresponding proportions when retired Fellows are included. (See Table 3.)

In 1970 the proportions working for life offices and as consultants were 63% and 9% respectively. Although more than one half of our Fellows still work for life offices, around one quarter now work as consultants. This, of course, simply reflects changes in today's business environment.

Up to this point I have, in one sense, been looking backwards. The composition of the Fellowship today is a direct consequence of our past history, upon which, I hope, my comments may have thrown some light. I hope that I may also have provided a few pointers to the future paths we should tread. In any event, tonight at least, time constraints compel me to abandon at this stage my statistical journey.

It would be inappropriate if I were to devote all of my remarks this evening to a retrospective analysis of our present position, since the future well-being of the profession is an issue with which we must all be concerned. I wish, therefore, to share certain thoughts with you, but, before continuing, I should make it clear that any opinions which I express are entirely personal and do not necessarily reflect the views of other members of the Faculty or of your Council.

Perhaps the most significant factor to affect us all in recent years has been the speed with which the nature and scale of actuarial work has changed. Actuaries of my generation need no reminding of the extent to which our traditional worlds of life assurance and pensions have been turned topsy-turvy, but we must also give due recognition to the wider and expanding roles now played by actuaries in non-life insurance and risk management work. Investment, finance, and asset/liability modelling are other areas in which our professional skills are increasingly perceived to be of value. Indeed the pace of change has been such that some actuaries today are tackling problems which had never been heard of, let alone considered, ten or fifteen years ago. This means that we are being faced with questions of a truly fundamental nature relating to the directions in which the profession will or should move over the closing years of this century and into the next.

The concerns felt in the U.K. as to how we should be developing our professional skills to meet these new and exciting challenges are shared by our fellow actuaries in many countries and are reflected in the fact that in 1990 the International Actuarial Association set up a small working party to consider the role of *The Actuary of the future*. This working party, chaired by Mr Akhurst of the U.K., contained other members from Belgium, France, Germany and the U.S.A. It reported to the International Congress held earlier this year in Canada. Those of you who participated in that Congress will recognise in my remarks which follow some of the points raised by the I.A.A. working party. I hope, however, that at the same time you will also recognise new concerns and other factors which have not yet been fully considered.

As evidence of the way in which our world has changed, one has to think only of the extent to which many actuaries are now working in an environment which is truly international – for some even intercontinental. Many may doubt the reality of the single European market for financial services so long as there is no level playing field for the

cross-border taxation treatment of life assurance policies, but – even so – it is clear that new opportunities and challenges, of major significance, are either with us or lurk just round the corner. One consequence of this new dimension to our work has been a growing wish within the profession to develop an internationally agreed code of conduct and standards of practice. It is fortunate that the profession itself is taking a lead on this issue, since there will inevitably be increased external pressures on this front and it is clearly desirable to anticipate any criticisms which may emerge.

In the U.K., of course, the Faculty and the Institute have worked together closely for many years on matters relating to professional conduct and standards. The 17 joint Guidance Notes alone provide impressive testimony to the efforts of many people. In Europe, the Groupe Consultatif has done much valuable work in this area and hopes fairly soon to recommend an agreed code of conduct to all its member associations.

There are, however, some actuarial associations which do not have an enforceable code of conduct for their members. I have already referred to the recent rapid growth in the size of the profession which has occurred in many countries. In my opinion this growth, combined with the wider range of work now faced by actuaries, makes it highly desirable that the profession strive for an internationally agreed code of conduct and common standards of practice. The achievement of such a goal is not likely to occur in the short-term. Differing legal systems and traditions – and other factors – are likely to make it a medium-term objective, but one well worth aiming for nevertheless. We have had an internationally agreed actuarial notation for 97 years. It is surely not too much to hope that, by an appropriate synthesis of varying national outlooks, we may achieve internationally agreed standards of practice. The development of such standards is essential, if misunderstandings are to be avoided when reports produced in one country are used in another.

If our professional activity is to continue to expand on an international front, one subject of growing importance will be the extent to which there is mutual recognition by other actuarial associations of the members of one actuarial body who wish to pursue their profession outwith their own country. I suspect that the attainment of such recognition on the widest front may not be even a medium-term target at the present time. Differences of culture, educational and legal systems, and the environment in which professionals work provide many pitfalls on the path forward.

It is my firm belief, however, that we should not be daunted by the thought of these obstacles. The fact that within the EC they have been overcome is evidence that where there is a will there is often ultimately a way. The attainment of mutual recognition is a desirable goal. I have heard it expressed by the words 'access to accreditation is vital'. Of course, such recognition or accreditation may come with strings attached, such as a period of adaptation or experience – and possibly the taking of some form of examination on local practice.

Closely related to the question of wider mutual recognition of qualifications is the extent to which there are, or are not, similarities in the processes of education and training in

different countries. Consideration of the present position shows that, while there are indeed many differences – usually arising from cultural and historical traditions – the amount of common ground is not insignificant. This prompts the question, "To what extent should the profession be seeking a set of 'core subjects' to form an internationally agreed basis for actuarial education?". Is it too much to hope that the existing similarities between the various national systems may provide a starting line from which progress can be made? Does the major review of our own educational and examination processes, conducted over the past three years, in any way put us in pole position in the race to a common goal? Tonight I do not propose to pursue this matter further, although it is, I think, a subject that will be of growing interest in the years ahead and is already under consideration by the Groupe Consultatif. Instead, I wish to reflect briefly on the significant changes, some of a very basic nature, which have occurred and have yet to take place in the education and training of actuaries in the U.K.

Your Council has always been aware of the need to reconsider the Faculty's examination syllabus at regular intervals. It is clearly essential that at any time the topics studied by would-be actuaries accurately reflect the professional and commercial environments in which they are likely to work. Over the past 30 years we have made four major changes to the structure of our examinations. It is a measure of the increasing rate at which our traditional roles are altering and our professional activities expanding that it was felt necessary to set up a Syllabus Review Committee in 1990, even although the previous such Committee had reported only four years earlier.

Although the content of our examination syllabus has been subjected to regular review for many years, it is only comparatively recently that our educational system has been given such close scrutiny. For a considerable time, the Faculty and the Institute – with separate examinations – operated a joint Tuition Service. However, for reasons which I never fully understood, the joint tuition arrangements were terminated in 1984, since when the two bodies have been providing tuition independently for their students. Over the past eight years there must have been much duplication of effort and waste of resources, ill affordable by a relatively small profession.

It is, therefore, gratifying to note that one consequence of the even closer co-operation now existing between the Faculty and the Institute will be the production next year of new and, we are confident, greatly improved tuition materials to be used by the students of both bodies. The Education Joint Committee has done sterling work and I take this opportunity to thank its members, the members of our own Education Committee, and the large number of other actuaries who have put so much effort into our educational activities. The profession owes much to these people.

I have, in a sense, got ahead of myself, since the joint tuition courses which I have mentioned are themselves only a logical consequence of a much more fundamental change. I refer, of course, to the forthcoming adoption (in 1994) by the Faculty and the Institute of a completely common set of examinations. These new examinations, agreed after the 1991 first-ever joint Council meeting of the two bodies, have been the

subject of such extensive discussions within the profession over a prolonged period that it would be inappropriate for me to dwell on them at length. Perhaps, however, I could make a few short points.

At present we almost have one common examination. In Applied Statistics the Faculty's paper and that of the Institute have all but one of their questions identical. Many years ago we had the Joint Preliminary Examination and much more recently, from 1981 to 1986, we shared the same papers in probability and statistics, Part 2 for the Faculty and Subject A5 for the Institute in the terminology of the day. Yet, when the syllabuses were reviewed in the mid 1980s, sufficient common ground could not be found and this joint venture was abandoned, with, I am sure, a consequential increase of work for the profession and further duplication of effort.

The setting up of common examinations over the entire range of subjects is a remarkable achievement and the result of a considerable and sustained effort by a great number of people. From time immemorial the syllabuses of our two bodies have always had much in common. Yet we have each felt sufficiently strongly about certain matters that complete agreement could never be found. Over the years the Faculty has worked closely with the Institute in relation to most issues affecting the profession in the U.K., but I suspect that the degree of co-operation may never have been greater than at present and that is reflected in our recent achievements. Each of us has been willing to abandon some sacred cows!

When I became an actuarial student the Faculty's examinations were held only once a year. This certainly concentrated the mind, but it also increased considerably the pressures! Of course, for many years now we have had twice-yearly examinations, but only in the earlier parts of the syllabus. One immediate consequence of the more efficient use of resources is that, from 1994, examinations will be held twice-yearly in *all* subjects. I hope that this new development will reduce, possibly significantly, the time taken by students to qualify.

Some of you may feel that the setting up of joint examinations will undermine the independence of the Faculty. I hope that I can allay any anxieties which you may have on this front by saying that, while we sincerely hope to maintain the highest possible degree of co-operation with the Institute, it is your Council's equally firm intention that the independent Scottish voice be heard as and when appropriate. The distinctions between Edinburgh and London are not only geographical – they are also national, historical and cultural. The existence of the two bodies – independently constituted but working closely together for the mutual benefit of the profession and those whom we serve, yet able to differ on occasions – may well be perceived as one of our strengths.

For most of my career I have worked mainly in a University environment. Over the years however, I have spent many happy hours outwith the academic cloisters and have benefited immensely from numerous wide-ranging contacts with the business world. I have always valued greatly these links, which have frequently provided exciting

opportunities, both intellectually and professionally, and have also led to several close personal friendships I might not otherwise have had.

Time does not permit me to describe the upheavals currently being experienced by the higher educational sector in this country, although I suspect many of you would be astounded by some of the changes which have taken place over the past year or so. Instead I wish to devote the final part of my remarks to considering briefly certain aspects of the relationship between the academic world and our profession, beginning with a brief historical perspective.

For many years, until relatively recently, the Faculty's examination syllabus included a fair amount of basic mathematics. For example, in the late 1960s the Part 1 papers contained questions on the convergence of power series, Leibniz's theorem, and integration. It is not, therefore, surprising that from the earliest days individual members of University staff have acted as examiners in mathematics for the profession.

The wider involvement of Universities in the English-speaking world with actuarial science did not, however, occur first in this country. In his book on the history of the actuarial profession in North America (in the early days of which several Fellows of the Faculty played a prominent part) E. J. Moorhead refers to developments at the Universities of Toronto and Michigan in the second half of the last century and to courses at the Universities of Iowa and Manitoba, which were established about the time of the First World War. Now, of course, the North American continent boasts several other University programmes in actuarial science.

As for Britain, R. C. Simmonds – in his history of the Institute of Actuaries – refers to classes for Parts 1 and 2 of the Institute's examinations provided by the University of Liverpool in 1907. For how long these classes persisted I have as yet been unable to determine, but it is probably fair to say that in this country the first major link between the profession and the Universities occurred just after the First World War, when the University of Edinburgh – in conjunction with the Faculty – introduced a Diploma in Actuarial Mathematics. (The original suggestion from the Faculty had been that the University might set up a bachelor's degree in Actuarial Science, but this had not proved possible.) To achieve the Diploma students had to pass examinations set by both the Faculty and the University. The first Diploma was awarded in 1920 and the last in 1964. During this period of 45 years the Diploma was awarded to 54 students, some 39 of whom subsequently became Fellows of the Faculty. Three of the 39 also became Fellows of the Institute.

The next development, although relatively modest, was significant in that for the first time actuarial students were able – as a result of their performance in University examinations – to obtain exemption from a professional examination in a 'non-mathematical' subject. (Graduates with an appropriate background had, of course, always been granted exemption from the purely mathematical papers.) This happened in 1952, when Mr H. W. Haycocks, then Secretary of the Actuarial Tuition Service, gave lectures at the London School of Economics as part of an undergraduate degree

programme. Students who performed sufficiently well in the relevant University examinations were granted exemption from the Institute's paper on mortality investigations.

Seventeen years later courses in actuarial mathematics, which offered the possibility of exemptions from the Faculty's examinations in compound interest and life contingencies, were set up at the University of St. Andrews. These courses continued for only two years, however, being terminated as a result of the move by Mr J. R. Gray in 1971 to the new Chair at Heriot-Watt University, where a separate Department of Actuarial Mathematics and Statistics was established in the following year. That this Department has flourished ever since is due in no small measure to the solid foundations established under Professor Gray's leadership over many years.

In 1973 the Actuarial Science Unit was set up at City University, London. It, too, subsequently achieved the status of an independent Department.

From a University viewpoint the establishment of courses in actuarial science has some attraction, since by now it has been clearly established that such courses appeal to students of very high calibre. Despite problems of resources, since the early 1970s a small number of other Universities in the U.K. and Ireland have also set up degree programmes with actuarial mathematics – to a greater or lesser extent – in the syllabus. I think, however, it is true to say that only Heriot-Watt and City have a significant number of actuaries among their full-time academic staff and it was these two Universities which, in response to the recommendations of a Review Committee set up by the profession, introduced the one-year postgraduate Diploma courses in the session 1985-86.

I am inclined to the view that, to a greater extent than almost any other profession we have succeeded in hiding our light under a bushel – at least as far as knowledge of our activities among young people is concerned. This is unfortunate, since – for school-leavers who have the relevant abilities, an inkling of what we do, and an interest in a career in the profession – a first degree with a significant element of actuarial mathematics in its syllabus has much to offer. Such a degree, if the course has been well planned, will be broad in scope and, educationally, both exciting and challenging. The young student will have his or her appetite well and truly whetted – and the possibility of exemptions from professional examinations will be an added bonus!

The majority of newcomers to the profession will, of course, continue to be graduates from 'non-actuarial' disciplines and, as in the past, most of these entrants are likely to embark immediately on employment as soon as they obtain their degrees. In recent years, however, for a small proportion of these 'non-specialist' graduates the one-year postgraduate Diploma has provided the first contact with actuarial work. When expressing the hope that the Diploma courses will continue to flourish I must declare an interest, but I am convinced that for the right students the Diploma offers a most attractive way to join our profession. My experience over several years has shown that the Diploma route has been perceived by a growing number of employers to be of great

value for carefully selected entrants. From the viewpoint of my own University, I take this opportunity to record our appreciation of the support of those companies who regularly sponsor Diploma students.

At this point I should like to say just a little about the practice whereby certain graduates may now be granted exemption from some of the earlier professional examinations purely on the basis of their studies at University. I do this in the hope of finally clearing up some misunderstandings which are still occasionally encountered.

Firstly – and here I am talking only about graduates from my own Department – there is the obvious point that it is *not* the University which grants any exemptions. It is the Faculty or the Institute, as appropriate. The University gives full details of the performance of each student to the Enrolment and Exemptions Committee of the Faculty, together with its recommendations and such further comments as are likely to be helpful, but the Committee is free to make any follow-up inquiries it deems necessary before coming to a considered decision in each individual case. A similar procedure applies to those of our students who join the Institute.

Secondly – and it is important that this point be fully appreciated – external examiners are used to guarantee that standards are fully maintained and that all decisions are fair and reasonable. Care is taken by my University to ensure that the external examiners it appoints are senior members of the profession with extensive relevant experience. The duties of our external examiners, from considering the draft question papers to making the final recommendations, are non-trivial and I am pleased to acknowledge our indebtedness to those colleagues (mainly from the business world) who over the years have generously given a significant amount of their time for this work. This indebtedness is, of course, shared by those of our Fellows who have themselves benefited from the exemption system. In years ahead some of you will, no doubt, be asked to discharge this obligation!

In making their recommendation to the Faculty, the examiners in my own Department bear in mind at all times two paramount considerations. Firstly, there is the absolute requirement of fairness in relation to the majority of students who are eligible for few, if any, exemptions. Secondly, there is the less altruistic motive of ensuring that the standard is sufficiently high that students who are granted exemptions may confidently expect to clear the subsequent hurdles set up by the Faculty's examiners. If this were not to be the case, the credibility of our degree and diploma courses would be seriously diminished – and rightly so. These two considerations alone guarantee that the obtaining of exemptions is no soft option. The Universities are, of course, fortunate that the possibility of exemptions attract to them some of the highest quality entrants to the profession.

I have, however, one concern in this area. Recently there has been evidence of an increase in the number of Universities which wish to be able to offer students the possibility of exemptions from our professional examinations. This may be welcomed as reflecting a growing interest in actuarial work, but it may also pose problems for the

profession, which has a clear responsibility to ensure that its high standards are maintained. It may be that in future there will be a greater need than hitherto for liaison between the profession and the Universities on the question of standards.

It is a feature of our professional examinations that, while the earlier papers provide a stiff test of technical knowledge and require a relatively high degree of mathematical ability, the later papers comprise an equally searching test of critical analysis, judgment and verbal communication – and, of course, those who generally have little difficulty in proving that $x + y = z$ (when this is indeed true!) are not necessarily those who find it easy to prepare a report for their Directors or for a client. The syllabuses of our later Parts are highly practical and relate to the day-to-day work of an actuary in the business or commercial world. For this reason I think it unlikely that the Faculty would ever wish to grant exemptions from its later examinations on the basis of study at University. That is not to say, however, that Universities have little to offer students in these Parts. For example, the Model Office Game, which has been run in recent years by the Students' Societies to highlight certain actuarial aspects of office management, was developed as a result of University research and teaching and in my own Department we have recently introduced final-year courses in life office practice and pension funds which are designed to be of considerable assistance to undergraduates in their subsequent studies for the Part 6 and Part 7 examinations. These new courses are computer-based and include a significant element of project work, during which students can gain valuable insights into practical problems in a simulated 'real world' environment.

There are, too, further ways in which the teaching skills and experience of your academic colleagues can be used advantageously by a wider audience. I am thinking, for example, of the provision of short courses for life office students or of seminars for the purpose of Continuing Professional Development.

The other major area where University actuaries can make a significant contribution to the activities of the profession is, of course, research.

A. R. Davidson (in his history of the Faculty) was perhaps slightly over-simplifying things when he said that work in the purely theoretical and scientific fields forms the basis upon which all progress must ultimately depend, but there is more than a grain of truth in his remark. In certain quarters – although, happily, I feel not widely within our profession – it is fashionable to decry studies which are essentially theoretical in nature. I strongly deprecate those who criticise a piece of research solely on the grounds that it has no obvious immediate application and I offer two reasons for rejecting such criticism. Firstly – and, although it is an easy thing to say, I believe it to be true – provided there is no ethical objection to a proposed piece of research, the pursuit of knowledge for its own sake is a laudable aim in any civilised society. (This thought, incidentally, must have exerted a subconscious influence on me when, after qualifying in a life office and subsequently working as a consulting actuary, I abandoned the business world to carry out research in pure mathematics.) Secondly, to those who reject this somewhat moralistic sentiment I pose the more pragmatic question, "Can you be sure that a piece

of work, which seems to you now of only theoretical interest, will not at some future time have an important practical application?". More often than not the answer to this question must be 'No' and, to illustrate the point, I recall the role played by Marian Rejewski who in the summer of 1930 returned to his native Poland (to take up a post at the University of Poznań) and shortly thereafter became the leader of a brilliant team of cryptographers which within a few years had broken the German Enigma codes and laid the foundations for subsequent equally outstanding work at Bletchley Park. The group theory previously studied by Rejewski and his colleagues as part of their University mathematics courses had provided the key to their historic breakthrough and today we must still be grateful that, more than 60 years ago, those young Poles paid such close attention to their first lectures in abstract algebra. This episode in Polish history is now fairly well known. What may be less commonly appreciated, however, is the fact that by returning to Poland in 1930 and becoming leader of the code-breakers Rejewski was abandoning in midstream a two-year course in actuarial mathematics at the University of Göttingen. With hindsight we may be grateful that this brilliant young mathematician forsook an actuarial career!

Closer to home, recent illustrations of theoretical developments which have led to significant practical applications are provided by the new model for permanent health insurance and the new standard tables of mortality, both published in the past two years by the CMI Bureau.

Having devoted some time to the defence of purely theoretical research, I hasten to reassure you I have not forgotten that most members of our profession deal very much in practical affairs. Of course, by the very nature of their work, your University colleagues are deprived of (or spared – it depends on your viewpoint!) the day-to-day excitements and tensions of business life, but you must not think that all academics lead dull lives and have little interest in the outside world – for some of us, at least, the very opposite is true!

One of the pleasures of working in an academic environment is the opportunity for frequent contact with sharp minds in other disciplines. In my University the actuaries benefit particularly from discussions with our own statisticians and mathematicians, but also with colleagues from other Departments – and, of course, we gain much from contacts with many of you who work in the business world.

In all these cases we hope that the resulting exchanges of ideas are mutually beneficial and certainly over the past few years there have been several felicitous examples of actuarial co-operation between academic and business worlds. The new PHI model is one such illustration and one may also think of the recent prize-winning papers on demutualisation (by our Bonus and Valuation Research Group) and on AIDS (by the Mortality Research Group). In the U.K. academic actuaries are fortunate to enjoy the loyal support and encouragement of most members of the profession – and of the insurance industry. This support and encouragement is sincerely appreciated and I hope that co-operative research work, such as I have described, may be seen as a further way

in which the academics are delivering something in return. Rest assured that the University actuaries are indeed keen to apply their skills to practical problems and value greatly the opportunity to collaborate with their business colleagues.

I am conscious of the length of time I have been speaking to you. There is much more that I could add, but – lest I be guilty of imposing on your courtesy to an unacceptable degree – I must curtail my remarks at this point. As the final item of my Address, I have the pleasure of reporting to you a most recent decision of Council.

It is a fundamental principle that in the deliberations of Council each member of Council should have the opportunity to participate fully in the discussions. There is, however, one situation in which this rule does not apply. This is, of course, when a matter under consideration relates to a particular member of Council in a personal capacity. For this reason Council found it necessary to exclude from its recent deliberations one of your Vice-Presidents. This was David Wilkie, whose contributions to actuarial science in general and to the Faculty in particular may fairly be described as exceptional and, happily, still continuing. Many would consider Professor Wilkie's research activities to be without parallel, certainly in modern times, but his work for the Faculty – and for the profession – extends to many other areas.

Council has decided that the Faculty should recognise the outstanding achievements of David Wilkie by the award of a Gold Medal and this is the news which I am privileged to report to you. This evening is not an appropriate time for the formal presentation of the Medal – this will occur at one of our Sessional Meetings early next year – but the award is so well deserved that I wished to take this opportunity to report Council's decision to you as soon as possible. I am sure that you will all share the pleasure which Council has felt in being able to grant this recognition to one of our most distinguished Fellows.

Now I really have finished! Looking back, I see that my Address has consisted of three parts – a statistical study, a discussion of some important current issues, and my thoughts about the role academics may play in the affairs of the profession. I hope that each of you has found something of interest in what I have had to say. I am sure that, just as my remarks have comprised three sections, so, too, we can all agree on three things. The Faculty is in vigorous health, we are living in exciting times, and the profession may face the future with confidence.

COMMENTS AT FACULTY SESSIONAL MEETING

[5th October, 1992]

Mr President, we knew that in you we were electing an experienced lecturer and proficient statistician and thus had high expectations. You have not disappointed us with your Presidential Address.

You have been most diligent in your pursuit of data and clear in interpretation. While it was easy for the last Presidential Address to omit a stochastic approach it must have taken real will-power for you to do the same.

We do not of course discuss your address, at least not formally immediately in this Hall, but I would just emphasise your points about the need for international identification of common standards for the core of actuarial education, and for codes of conduct and standards of practice – and I could add terminology, and international notation, which have not been updated or extended since 1954.

As an academic your experience has been different from most of us. However, earlier you had the experience of working both in a life office and a consultancy before embarking on your University career, which has been in two continents, so in fact your background is wide and valuable.

It is not uncommon to have actuaries who are Professor Doctor in Europe, as we were reminded by the distinguished gathering last year at the Groupe Consultatif Summer School here in Edinburgh, but it is much rarer in this country.

I am sure we all wish you well for the remaining period of your office, which has started on a high note also with your announcement of the very rare distinction of the award of a Faculty Gold Medal.

Thank you for an interesting and stimulating address.