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SOME THOUGHTS ON THE ACTUARY OF THE FUTURE

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an Introduction to the Discussion

ABSTRACT

Actuarial practice has been changing rapidly over recent decades, and this speed of change is likely to continue. The actuary of the future will face challenges from many quarters, including the need to communicate with multi-disciplinary teams of competing professionals, and to live in an increasingly multi-national and cross-border environment. The discussion paper reviews such trends and challenges, both national and international, and seeks to stimulate a discussion of key issues, including supply and demand, expanding the scope of actuarial work, the role of the consultant, training implications and the development of a more international profession.

KEYWORDS

Actuary; Future

A philosophy can be assessed by its attitude to the future; a profession can be defined as one which has the right to control its own work.

1. INTRODUCTION

1.1 A striking feature of the development of actuarial practice over the past decades has been its speed of change. This applies across the breadth of the profession, and has been brought about by influences such as:

- the growth in complexity of issues in many professional areas,
- the increasing power of computers to perform large volumes of calculations, and to have access to vast quantities of data,
- the continuing development of analytic and applied mathematical processes,
- the convergence and inter-action of many financial services,
- the development of new financial instruments such as options and futures, and
- the growth in cross-border activity and requirements of multi-national companies, whether within the European Community or wider afield.

1.2 This changing environment has stimulated much thought about the implications for the actuarial profession. In the United Kingdom, the issues involved are being addressed through the 1991 Institute/Faculty 'Strategy for the 1990s' paper, by the Futures Committee, including the recent reassessment of the U.K. examination syllabus and requirements for professional training, and through numerous other papers and discussions. An American Task Force has

been working for some years on 'The Actuary of the Future'; the Australian Institute has debated this topic, and the International Actuarial Association has set up a working party to report for the Montreal Congress.

1.3 The IAA has done much to foster the exchange of knowledge and experience between actuaries of many countries, and to encourage development and widening of the profession through new bodies such as ASTIN and AFIR. Nevertheless, the role and standing of the actuary still varies very widely across the world. There are to date, and perhaps surprisingly:

- no meaningful International Actuarial Standards akin to International Accounting Standards, although agreement was reached on the International Actuarial Notation long ago;
- no real commonality of basic guidance notes, codes of conduct, training programmes or contents of examinations;
- no international training facilities; and
- no agreed or legal definitions of 'an actuary' in many countries, or even within the European Community.

Yet for some reason, 'actuaries' are generally an easily recognisable species, whatever their habitat.

1.4 Two significant steps forward have been achieved in 1991 through the Groupe Consultatif at a European Community level:

- (1) agreement by fourteen European Actuarial Associations of the common actuarial life insurance reserving principles subsequently incorporated by the European Commission within the proposed Third Life (Framework) Directive; and
- (2) the Agreement signed in April 1991 by the same Associations to assist the implementation of the Diplomas Directive. This provides for the mutual recognition of other European actuarial qualifications, subject only to working knowledge or experience of local practices.

1.5 With the opening up of national boundaries, and the increasing interdependence of the international financial world, it is difficult to consider the future of the actuarial profession in purely national terms. The strategic priorities for the next few years agreed by the Councils of the Institute and the Faculty also take account of such international influences. These notes are intended to stimulate further discussion on the long-term end product—the actuary of the future.

1.6 These notes also aim to question any lurking complacency about the current state of affairs, and looking prospectively, to ask:

- What will distinguish our profession from others in the future?*
- What will actuaries be able to deliver at an affordable price?*
- Will the profession be as dependent on the life and pensions industries as in the past?*

—How far should we actively seek to unify the profession across international boundaries?

2. WHERE DO WE START FROM?

2.1 *Development of the Profession*

2.1.1 The U.K. profession has been growing steadily over recent years from its first origins in life assurance. This is illustrated by membership figures for Fellows of the Institute and the Faculty (including overseas members):

Year	Institute	Faculty	Combined
1950	657	284	941
1960	963	347	1,310
1970	1,351	442	1,793
1980	2,250	569	2,819
1990	3,227	720	3,947
1991 (at 6.9.91)	3,475	766	4,241

2.1.2 These compare with the latest available figures from Groupe Consultatif records for European Associations:

Country	Year	Numbers of actuaries	Approximate numbers of actuaries per million population
Belgium	1991	405	41
Denmark	1989	166	32
France			
IAF	1990	452	} 16
ISFA	1991	471	
Germany	1989	584	9
Greece	1989	44	4
Italy	1989	468	8
Netherlands	1991	367	24
Portugal	1989	76	7
Spain	1989	1,070	28
U.K. (at 1.1.91)	1991	4,102	71
c.f. U.S.A.	approx.	11,000	44
Canada	approx.	2,000	75

2.1.3 The structure and nature of national associations still varies widely:

- In the U.S.A., a long-established specialisation exists, with separate organisations for life and casualty actuaries, as well as for those within public practice. There is a unifying umbrella organisation, open to all actuaries, but it is not as effective as a single body.
- In France and the U.K. more than one association exists, each with its own

- disciplines and training; Italy has two parallel associations, one scientific, and one professional; in other European countries there is usually only one national body, although there may be several routes to membership.
- In some countries such as the U.K., U.S.A., Australia, Japan and the Netherlands, the national associations are largely responsible for the technical education and examination of professional actuaries, as well as for the maintenance of professional standards; such education is usually combined with practical training, following on from a university first degree.
 - In other countries, the required mathematical and technical training is often combined within long university courses, with the national associations functioning as learned societies for those who have thus graduated, or who are otherwise invited to join.
 - In Germany, for example, there is no requirement for 'insurance mathematicians' to belong to the national associations, nor, at least for the present, are there enforceable guidance notes or disciplinary procedures based on codes of professional conduct. However, all of these aspects are now under active discussion.

2.1.4 Actuaries in the U.K. and Ireland were given significant early responsibilities in a strongly growing life assurance and pension fund sector, with several of these responsibilities now on a statutory basis. These factors have contributed, as in the U.S.A., to the relatively large size of the profession in those countries compared to the rest of Europe, as well as to the prized 'right to control its own work'.

2.1.5 Such responsibilities are ones which many of the European associations would now seem keen to obtain on behalf of their members in the general deregulation of centrally controlled markets now in prospect in Europe.

2.1.6 Despite much of the steady growth in the profession in the U.K. being demand led, with supply generally lagging, a substantial number of experienced actuaries have been doing other things. This was illustrated in 1985 by a survey of employers of a sample of 1380 actuaries by the Educational Working Party of the U.K. Futures Committee:

	Actuarial work (%)	Non-actuarial work (%)	Total (%)
Managerial	23	14	37
Communicators	21	3	24
Technical/analytic	26	5	31
Other	6	2	8
Total	76	24	100

2.1.7 At the time of the survey, demand for qualified actuaries was expected to grow by possibly 75% over the next ten years. There seems to be considerably more doubt now as to whether this position of demand exceeding supply is going

to continue. In Spain for example, supply has reacted very fast; it is believed more newly qualified actuaries are now being produced there annually (around 400) than in the U.K.

2.2 *The Essence of the Profession*

Actuaries do actuarial work, actuarial work is done by actuaries.

2.2.1 Opinions vary as to the essence of the actuarial profession. One perspective centres around the practical application of the science of uncertainty; a second on the actuarial involvement with financial security systems; while a third focuses on the synthesis of underlying financial and mathematical skills; none of which in themselves are unique to the actuary.

2.2.2 In many continental European countries, the emphasis on substantial academic training, combined with the structure of the industry, has led to the actuary often being regarded more as an expert technician than an overt financial manager. Even in the Netherlands, one prominent actuary has called for actuaries to 'come out of the back room'.

2.2.3 The recently adopted U.K. mission statement puts the alternative business view succinctly and unambiguously:

"to develop the role and enhance the reputation of the actuarial profession in providing expert and relevant solutions to financial and business problems, especially those involving uncertain future events".

2.2.4 In 1989 a task force of the Society of Actuaries produced a valuable report on 'The Actuary of the Future', including the similar and corresponding American mission statement. The task force, emphasising the 'synthesis' aspect of actuarial training, pointed out:

"First and foremost, actuaries are eclectics rather than scientific specialists. While they use calculus and statistics, they are not necessarily at the cutting edge of those subjects. Similarly exposure to economics, accounting and law makes actuaries conversant with, but not experts in these subjects . . . the combination of subjects studied (is) a combination few other professions are likely to have encountered."

2.2.5 When to specialise has long been a focus for debate. It would seem clear that the 'actuarial coalface' is being hewn deeper and deeper, and in different directions by the various specialisms. There is only so much material that can be fitted in to basic training—yet demands are increasing in all directions; the U.K. 'business expert' tends to be developed initially at the expense of a deeper mathematical specialism.

2.2.6 One encouraging sign is of increasing international debate and apparent convergence between actuaries on some basic principles of actuarial thinking. Considerable national differences in application will undoubtedly remain—but a move towards education of principles before national detail would seem a positive one, a route down which the U.K. is now going.

2.3 *What Kind of Actuaries are Actuaries?*

2.3.1 Recent surveys have come up with similar pictures of actuaries on both sides of the Atlantic.

2.3.2 In 1988, the *Jobs Rating Almanac*, published by L. Krantz, evaluated actuaries in the U.S.A. as having the best job out of 250, based on combined high scores in working environment (2/250), income(25/250), physical demands (4/250), stress (15/250) and outlook (5/250).

2.3.3 The U.S. Task Force surveyed those actuaries who worked closely with, or employed other actuaries in the U.S.A. The U.S. poll highlighted the insiders' view that actuaries:

- are bright problem solvers,
- are narrow, unwilling to look at the broader picture,
- are trained as individualists, and have poor management skills,
- make things complicated,
- are poor communicators with non-actuaries,
- are ethical beyond reproach,
- are defensive, arrogant and rigid,
- are best prepared to put money and risk together, and
- need to increase public awareness of the profession.

2.3.4 The Faculty Marketing Research Group found in 1990 that members of the profession considered the current image of the profession to be 'technical, dull, complex and lucrative', whereas they would wish them to be seen as 'influential, challenging, respected and responsible'. They considered that general awareness of the profession fell far short of that which could be desired, except among related professionals.

2.3.5 Both studies detected signs of complacency . . . *but how complacent can the actuary of the future afford to be?*

3. SOME FACTORS AFFECTING THE FUTURE OF THE ACTUARY

3.1 *The Demographic Time Bomb*

3.1.1 As has been discussed extensively in different contexts, many of the more mature economies of the world are facing a common demographic time-bomb in the years ahead. In these countries, populations are ageing, sophisticated health care costs are increasing, and personal savings are increasingly needed to ensure an adequate standard of living and care before and after retirement. It is by no means certain that smaller families and dwindling work forces will willingly otherwise support the growing population of longer-living, earlier-retiring pensioners.

3.1.2 Governments of developed economies worldwide are tending to a more minimalist approach to social security benefits, pressured partly by the desire for lower taxation and partly reflecting the cost strains that the comprehensive post-war community care ideals are already beginning to impose.

3.1.3 In the third world, the situation is often entirely the opposite. Young, growing, poor, urbanising populations need a basic sound structure developed which can benefit from the experience and help of the developed countries.

3.1.4 In neither case will the solutions be easy at either a political or personal level. The supposition that a retiree will, for example, happily swap accumulated wealth (house, savings, etc.) for a promise of life-long care, can run up against an inherent desire to leave something to the offspring, despite the often modern day lack of reciprocal old age family support.

3.1.5 The challenge, therefore, affects long-term support as well as earlier disability, health care as well as pensions, spreading and retention of wealth and the role of savings in the community as well as national economic management. It must represent a major opportunity for the profession to play a significant role in the proper management of such needs in areas comprising or closely related to existing specialisms.

3.1.6 On a wider basis, this illustrates the importance of the public interface of the profession, and the role the actuarial profession as a whole should be aiming to play in future public debate of social security, pensions and the health care needs of the 'greying' population.

3.2 The Growing Power of Computers

3.2.1 This is a double-sided coin—both an opportunity and a long-term threat (although few actuaries appear to perceive it as such). In the last 25 years, the growth in the power to manipulate data and to perform vast volumes of calculations has led, amongst other aspects:

- to a major diminution in the historic need for actuarial approximations and shortcut functions,
- to the development of complex cash flow projection techniques, scenario testing and stochastic modelling as a growing norm for many calculation processes.
- to the automatic handling of many routine calculations, and a certain loss of traditional training opportunities en route,
- to the development of more complex products—yet once products such as unit-linked are set up, they often need less actuarial involvement thereafter,
- to increasing demands for sophisticated analysis of the vast amounts of data being gathered by financial and other organisations, and
- to increasing human and technical problems concerning management of this speed of change.

3.2.2 The exponential rate of growth in such computing power shows no sign of slackening; the ability to use such power is now often lagging through bottlenecks in software, skilled manpower and analytic theory. Some systems are already beyond the ability of one human mind to design or programme, yet we need to direct and control them in order to concentrate on our real actuarial tasks.

3.2.3 When we consider the current power of computers to play chess at grandmaster level, an intellectual/strategic skill perhaps as highly rated as that of actuaries, it is sobering to reflect that in a few years, chess may cease to be of much interest. Very powerful computers will evaluate the ultimate possibilities of all moves to determine the opening strategy(ies) which cannot lose. Perhaps fortunately, real life can never be fully determined by algorithms, however complex.

3.2.4 Nevertheless, the prospects for equally rapid developments in expert systems programming, fuzzy logic and other inference engines, together with further actuarial programming of complex algorithms and automated evaluation of complex trends from vast data-bases, lead to the conclusion that actuaries of the twenty first century are going to have enormous power at their fingertips, as well as having their wits tested against very powerful logic machines. Non-actuaries may well have quite efficient automated 'actuarial' calculators to hand for many purposes.

3.2.5 *What questions will the actuary of the future be trying to answer . . . and how many actuaries will this process need?*

3.3 *Safety in Numbers*

3.3.1 Actuaries have been much concerned with bringing stability to the management of financial security systems. This has often been achieved through use of cautious assumptions, and the development of methodologies to cope with variations in emerging experience, for example long-term pension funding rates or smoothed life bonus distributions, whether through a U.K. life fund mechanism or by management of the timing of realisation of capital gains elsewhere in Europe.

3.3.2 Although such processes are not necessarily very capital efficient, they have been historically viewed as an acceptable price to pay for a perceived level of high security. Hidden reserves, cautious valuation bases and substantial capital appreciation, with some historic parallels in pensions management, often led to large surpluses emerging.

3.3.3 Pressures for systems which reflect more immediate benefit for good performance have led to unit-linking, terminal bonuses and contribution holidays. Fiscal pressures are increasing everywhere to reduce cautious reserving levels, with equalisation reserves as one actuarial response. Fear of such pressures from potential recipients and fiscal authorities is currently also fuelling continental resistance to compulsory disclosure of market values of assets.

3.3.4 Unless the financial organisation is then insulated from the outcome, for example as is largely the case in unit-linking in the U.K. today, the financial consequences of the actuary being 'wrong' through pressure to use central estimate assumptions are likely to be more visible and immediate. The expert will become more and more exposed. This applies to profit reporting in life business, reserving in general business (especially in the area of U.S. liability and pollution) and pension benefit costing, as well as to many other areas. Risk distribution

explanations are not always easily understood or even applicable. *How significant an impact could this have on the image of the profession?*

3.4 *Traditional Activities Under Threat*

3.4.1 Given a perception of the actuary as essentially a synthesiser of skills, other specialists now seem to be developing such individual skills well beyond the level of normal actuarial involvement. Such specialists include:

- statisticians,
- demographers,
- investment analysts,
- financial economists,
- lawyers,
- tax experts,
- corporate financiers,
- marketing managers,
- data processing/management information managers,
- accountants,
- insurance managers,
- benefit consultants, and
- risk managers.

3.4.2 While benefiting from the availability of such skills, they can often push the actuary towards more of a niche role. This is not to say that individual actuaries are not in the forefront in some of these specialist fields; but most of those who are, are not actuaries.

3.4.3 *Even today, we could each ask ourselves how much work a typical day is, in reality, based on unique actuarial aspects as opposed to shared skills, how much on a developed ability to 'see problems in the round', and how much on practical business experience which is open to good managers from all backgrounds?*

3.5 *What Price Actuaries?*

3.5.1 Despite the increasing level of communication and business skills needed to be effective in the convergent professional arena of today, the actuary still has to provide practical solutions at an affordable price. Part of the process of the development of specialists discussed above, is that they often do not need many aspects of actuarial training, and can therefore provide the requisite input at a cost-effective price.

3.5.2 Marketing managers now influence many life office decisions; much increasingly complex cash flow analysis, company modelling and evaluation is undertaken by accountants, investment analysts and management consultants; related specialist software development is often produced by computer experts, aided by statisticians. Perhaps saddest of all, the actuary, until the birth of AFIR and FIMAG, let the financial economist have an almost free run of modern investment theory.

3.5.3 The more skills required of an actuary as specialist demands increase, the higher the price to pay for the experienced product, and the more difficult to develop and train. The more complex the issues, the more specialist the response.

3.5.4 Actuaries are often said to thrive on complexity. Must there not be a danger that they become an integral part of a system so complex that it is discarded in whole or in part in favour of simpler, cheaper or less equitable solutions? One can ponder, in this connection, on the complexities of final salary pension schemes as opposed to (apparently) simpler money purchase alternatives; of sophisticated commission-loaded life products compared to cheaper, more straightforward over-the-counter bancassurance products; of the push towards level playing fields in the taxation of savings products and of the superficial, but continuing, attraction for many regulators of standardised premium and valuation bases.

3.5.5 It also seems clear that the European Commission sees actuaries as serving corporate customers well able to look after their own interests and who, therefore, do not need special protection. It therefore seems quite prepared to leave the profession open, in principle, to market forces. The more widespread attainment of a legal role and definition of 'an actuary' and of the right to self-regulation may not be so straightforward in consequence.

3.5.6 Despite the growth in financial service industries, it seems that more doubts now also exist as to whether the supply of actuaries might not soon catch up with demand. A classic economic answer, when in such a position, is:

"sell more, sell wider or reduce the price".

3.5.7 *What price actuaries in the future?*

3.6 *The Growth of Actuaries as Consultants*

3.6.1 One aspect of the U.K. profession which mirrors that in the U.S.A., but which appears to have been little debated, has been the marked trend towards actuaries as consultants. The three largest employers of actuaries in the U.K. today are all firms of consultants. The approximate proportions of consultants within the active Fellows and Associates of the U.K. Institute were as follows:

Year	Consulting (%)	Life Offices (%)	Other (%)
1955	6	76	18
1987	32	54	14
1990	38	51	11

(Categorisation: ACA/Institute)

3.6.2 The reasons for this trend may prove significant in any 'sell more or sell wider' task for actuaries in the future, and in coping with some of the educational problems discussed below. Consultants are primarily engaged in two major activities:

- providing full actuarial services to companies, pension funds and other bodies who require them, but who do not employ their own actuarial staff, and
- providing specialist actuarial advice and support to fellow actuaries and other professionals on a needs basis.

3.6.3 The growing proportion of consulting actuaries, paralleled in some other professions such as accountancy, has occurred in a period of excess demand, and has, on a commercial basis:

- been a relatively efficient mechanism to enable a pool of specialist actuaries to meet a substantial part of this wider demand,
- allowed those company actuaries lacking particular specialist or up-to-date skills to have an alternative method besides recruiting or retraining to import such expertise into their organisations,
- added considerable weight to the development of a strong research and implementation facility within the profession, in conjunction with the efforts of individual actuaries and the universities,
- encouraged the development of a pool of marketing skills within the profession as a whole, which could prove significant in development into new fields, and
- encouraged the international transfer of knowledge both on a commercial basis, and through the specialist associations of consulting actuaries.

3.6.4 While consultants' advice often covers wider issues, the focus of an individual consultant is usually towards developing a 'coalface' specialisation within an applied business environment, and is aided by exposure to similar problems across a wide customer base. While recent growth in insurance consultants has been largely through transfers of experienced actuaries from companies, a far higher proportion in future is likely to have been fully trained within the consultancies, as is now the case in pensions and employee benefits work.

3.6.5 The availability of such specialist services, not only actuarial, but across a wide range of business areas, has been a significant factor in the ability to get new insurance and financial service companies up and running, particularly those based on specific distribution networks or new technologies. As such, it is speeding up the evolution of the financial service industries of Europe and elsewhere.

3.6.6 Factors such as marketing, distribution and inter-related business skills may ultimately lead more actuarial consultants themselves, like many of their insurance customers, to integrate into wider financial service groupings. *How important is the role of the consultant to the future of the profession? Indeed, how independent will the profession itself be in the future?*

3.7 *The Actuarial Policeman*

3.7.1 The role of the Appointed Actuary in a life company is an important one, which contributes to the public interest through professional responsibility in financial management, thus facilitating a progressive system of insurance

control. As a kind of policeman on behalf of the policyholders, he or she also ensures that the rules have been followed, that the proprietors have not dipped their hands in the till, and that fair play has generally prevailed.

3.7.2 In Italy, it is legally required that an independent actuary certifies that the general insurance data on which the balance sheet provisions are based are correct (which can prove difficult) and that the claims provisions are sufficient. The actuary certifies this to the auditor who then signs off to the company. In the U.K. the role of actuaries assisting audit teams has also proved somewhat contentious, if for different reasons.

3.7.3 If the Appointed Actuary in the U.K. becomes over-weighted towards a government certification role as perceived by fellow managers, this could lead to loss of much actuarial management influence in the running of the company. Indeed, the position of chief actuary has become increasingly divorced from this statutory policing role.

3.7.4 The U.K. approach to life insurance via 'back end' supervision of adequate levels of reserves, together with asset matching considerations, leaves the freedom to set premium rates, policy conditions and investment strategy to the good sense of each company and to market forces. The proposed European insurance 'framework' Directives enshrine largely similar concepts; they are therefore of vital importance to the future of the U.K. profession, especially in the life assurance field.

3.7.5 There have been instances, especially in Canada and the U.S.A. in the last decade, where the financial outcome of such life premium freedoms, coupled with injudicious asset dispositions, has been less than desirable. The U.K. approach has worked reasonably effectively in the U.K.—but in the finalising of the framework Directives across Europe the U.K. profession needs to appreciate the difficulties that exist in implementation of a similar structure in commercial environments in which the actuary has not been so historically well placed, where the profession does not control its own work, and where the prospect of a switch to 'rear-end control' raises many qualms.

3.8 *Where there is Risk . . .*

3.8.1 The historic origins of actuarial work spring essentially from life and pensions business—indeed one could say from studies of mortality and compound interest. Through the activities of many pioneering, and often adventurous individual actuaries, the application of actuarial thinking has already spread through general insurance and investment fields into areas well outside narrow traditional fields of activity. Indeed, it has been said that where there is financial risk, there should also an actuary be.

3.8.2 Ideas about the areas into which actuarial involvement could develop further within the continents of North America and Australasia include:

- strategic planning,
- foreign exchange,

- law firms,
- environmental risks,
- weather forecasting,
- continuing care communities,
- health insurers,
- property development,
- all long-term capital projects,
- agriculture,
- measurement of economic value of human life, and
- space research,

in addition to a number of roles and sectors in insurance and investments where few actuaries, if any, currently work.

3.8.3 As the U.S. task force emphasised, it is up to the actuary to prove what he or she can do, rather than waiting to be asked. Marketing skills and research skills will not come amiss in ‘selling wider’; the question is whether these activities can really become more than just peripheral to the mainstream.

3.8.4 *Are we looking widely and deeply enough at what the profession as a whole could achieve outside the more traditional spheres?*

3.9 *Where do We Stand?*

3.9.1 At a philosophical level, the ability to analyse more and more risk differentials—for example through gene testing as well as computer-based risk analysis—raises fascinating questions about the underwriting and pooling of risks (as in many insurance and pension systems). Undoubtedly, strong commercial pressures will continue for increasingly sophisticated risk differentiation, while social pressures resist such segmentation.

3.9.2 A good example of this process is the varied responses provoked in the treatment of HIV sufferers. AIDS has raised ethical, social and political issues from which the actuary cannot remain entirely divorced.

3.9.3 *Where do we stand as a profession on questions such as genetic testing?*

3.10 *The Training of the Future Actuary*

3.10.1 Education has to be based on a vision of required future skills. It has to be practicable, and to maintain an adequate supply of well-trained professionals to service the large body of existing roles, as well as to develop new ones. The process is the longest term one of all strategic planning aspects: the selection and training in place today will shape and define the capabilities of the actuary well into the next century.

3.10.2 The approach now envisaged in the U.K. to keep the training process within bounds could be summarised as:

- concentrating on principles as opposed to detail in the early training, accepting that even on qualification the actuary is still in embryo form,
- instituting an (obligatory) post-qualification professionalism course, coupled

- with a professional code of conduct and practising certificates to restrict professional activity to that for which the actuary is adequately trained,
- providing guidance notes to maintain professional standards,
- developing more continuing professional education facilities, including a prospective actuarial MBA,
- leaving the remainder of business/skills training to individual/employer efforts, and
- encouraging specialism post qualification through Institute papers, GISG, FIMAG and so on.

3.10.3 The U.K. is slowly building university training programmes, but has been behind other European countries in the development of such courses. A more specific academic period of training with a strong mathematical bias can strengthen the theoretical base of the profession as well as speed up the initial qualification process. Consider, for example, the development of risk, credibility and other theories for which a number of practical uses are now emerging. In making the 'embryo' more prepared for coalface technicalities, universities can also be a ready-made forum for some continuing professional education.

3.10.4 How to facilitate the development of deeper applied specialisms, to add further business skills beyond the 'embryo' qualification point of one of the toughest and longest professional courses, and to maintain up-to-date awareness of developments across related fields thereafter, is the conundrum which continuing professional education has yet fully to resolve and is one common across all countries with an active profession. As computers take over more and more routine tasks, 'workshops' may also prove necessary to give participants a practical feel for many otherwise theoretical situations at all levels of work.

3.10.5 We clearly benefit from the stimulus of a wide church of actuaries, be they mathematical theorists, insurance, pensions or investment experts, managers, marketers, or computer buffs. Much would seem still inevitably dependent on maintaining the calibre of people being attracted into the profession, and on their continued self-motivation to develop ideas.

3.10.6 *But which comes first educationally as the specialist coalfaces continue to advance deeper into the twenty-first century . . . more theory or more practice . . . wider skills or more specialisation?*

4. INTERNATIONAL CO-OPERATION

There's no such thing as strangers, just friends you haven't met yet.

4.1 *Should We be Searching for Common International Standards?*

4.1.1 It is now impossible for actuaries to remain totally segregated within national boundaries. Multi-national companies straddle boundaries; cross-border pensions, life and general insurance activities are becoming a wider reality, especially through the drive towards European integration. Wider

barriers still may fall as GATT and other free trade agreements extend to cover financial services.

4.1.2 The success of the Groupe Consultatif proposals on life reserving principles and mutual recognition of qualifications suggests an intensification of the quest for more general agreement on actuarial standards, both within Europe and, as far as practicable, internationally through the IAA. Such agreements tend to be more persuasive of governments than single voices of associations thought of as representing only national interests, and help to create a more unified world-wide profession. They also facilitate the multi-national processes and directives themselves.

4.1.3 Such agreements can apply, not only to principles to be followed, but also to the way actuarial advice itself is given; namely the ethical and professional approach and procedures adopted. They would, however, be hard to implement without a more general move towards the ultimate ability to discipline members who let such standards down ('the right to control . . .').

4.2 The Development of the International Actuary

4.2.1 It is often difficult to consider the position of an actuary in isolation from the market in which he is working. For example, Germany is seen by many as the opposite of the U.K. in insurance and pensions practices, yet the German Association is not only taking steps to turn itself into a professional body, but has also recently put forward ingredients for a commonly shared level of technical knowledge for the actuary of the future with which few U.K. actuaries might disagree. These, together with 'appropriate mathematical and stochastic training', include:

- the methodology of investigating and forecasting mortality, disability and other occurrences,
- the principles of adequate premium calculation,
- methods of experience rating,
- calculation of surrender values allowing for antiselection,
- calculation of mathematical reserves,
- statistical methods in the field of capital investment including studies of volatility,
- mathematical evaluation of capital investments,
- fundamentals of accounts, together with calculation, trending and analysis of profits,
- fundamentals of profit participation and bonus determination based on principles of equity,
- principles of collective risk theory,
- principles of pension-related actuarial mathematics and collective financing, and
- mathematics of general insurance claims distributions.

4.2.2 While opinions still differ somewhat between Germany and the U.K. as

to the practicability of currently including 'a widely experienced financial manager' in the standard job description for an actuary, these differences could also disappear as market demands evolve. There is, however, common agreement on the necessity for the actuary to achieve a wide level of technical knowledge, at the same time with specialisation being unavoidable. This suggests the most constructive search is for a common kernel of ideas, and that these may well prove easier to find than perhaps anticipated.

4.2.3 In the U.S.A., the total splitting of the profession between casualty and other specialisms would seem to be increasingly regretted; concurrent individual membership of an umbrella organisation—the AAA—as well as one of a number of actuarial bodies does not appear to have solved the problem, and closer co-operation is felt desirable by some, both nationally and internationally. Again, some common grounding of principles and education is thought to have advantages.

4.2.4 An awareness of other market practices is as much a specialism as any other to which much time must be devoted. Yet the influence of multinational financial activity is growing rapidly, as discussed earlier. The directives from Brussels are but one potent force in opening up borders around all professional fields within the European Community. The question is how to add yet another dimension onto the non-specialist actuarial consciousness.

4.2.5 There would seem much scope for proactive development of study courses, exchange programmes and work experience on an international level; the most obvious candidates to organise these are the Groupe Consultatif as with the recent Summer Schools, and more widely, the IAA on a 'post-graduate' basis. The IAA is now addressing this issue on an urgent basis; the American Associations are currently also active in this area in Hong Kong, Taiwan and Mexico.

4.2.6 Of great importance are not only the interchange of information between actuaries in the developed actuarial world, but also the provision of training, encouragement and help to developing countries, including Eastern Europe. Not often does the necessity arise to completely restructure new industries and social systems in the Western world—the responsibilities involved here are a tremendous challenge.

4.3 How do We Cope with the International Information Explosion?

4.3.1 A remark made to me by an erudite actuary recently was that he often found it easier to write a mathematical routine than to search through a catalogue to see if one already existed which fitted the bill. He was not talking about an international actuarial software catalogue, nor even a national one, but about his own!

4.3.2 If this remark is generalised into multiple disciplines and scores of different languages in many different locations, it illustrates the difficulty actuaries have, and will have, in being aware of what is being done next door in our global village, and in avoiding massive duplication of effort.

4.3.3 Being a small profession can have its advantages—although the U.S.A., for example, does not possess the single site meeting places of many European Associations. Even then few associations, even in Europe, are in frequent communication with their whole membership.

4.3.4 A major disadvantage of a small size profession is the lack of commercial support for dissemination of actuarial information. Congresses and special meetings have an important role to play in this process; *what is really needed is a more systematic and readily accessible international information system . . . but in what languages, and paid for by whom?*

4.4 *Should We be Aiming to Become an International Profession?*

4.4.1 Over the years, a number of voices have called for the development of a truly international profession. Given the wide variety of the human race, political and economic dichotomy, and a penchant for continuing to associate within identifiable units, such a nirvana is felt unattainable by many others, at least within the time span of ordinary actuarial projection. Indeed, the variety and liveliness associated with smaller units is felt by many to be a strength.

4.4.2 Nevertheless, such co-operation as has been achieved to date has borne substantial fruit, and there seems every argument for continuing to maintain a goal of closer international co-operation. In practical terms, this would seem most feasible in stages through the current combination of local associations under a global IAA umbrella, involving:

- continued development of information exchanges between actuaries of different countries and backgrounds,
- co-ordination of development of training programmes at pre- and post-qualification levels on an international basis, including encouragement of applied management skills,
- a move towards a more common international syllabus, based on agreed core actuarial methods and techniques, and greater equivalence of levels of training therein,
- a more active search for agreed common standards,
- establishment of broadly similar codes of conduct and professional guidance for actuaries, enforceable by local associations under the overall aegis of the IAA,
- wider mutual recognition of qualifications beyond the new Groupe Consultatif European Community scheme,
- acceptance of a continued need for local knowledge and experience where appropriate, involving national legislation, taxation and market practices,
- encouragement of personal specialisation and development, whether in an academic, research, implementation or management role, and whether in life, health or general insurance, pensions, investment or other discipline, and
- provision of direct assistance to newly formed actuarial associations in Eastern Europe and elsewhere.

5. CONCLUSIONS

5.1 Opportunities for actuaries are clearly ahead—Western populations are ageing, new or old social and financial security systems have to be managed wisely within a complex economic environment, and a large base of existing roles has to be supported. Challenges will come from other professionals, and the need to develop communication and other business skills stems particularly from the requirements for the actuarial specialist to be part of an inter-disciplinary team activity now common in many financial sectors.

5.2 A longer and more specific first degree could advance the starting post for many actuaries, together with deeper post-graduate fellowship training and specialisation. This option would tie in better with the similar and mutually recognised continental route to first level qualification. Such a change could only develop gradually, and care would be needed not to lose the practical element to training nor the high qualifying standard that is an important element within the U.K. philosophy.

5.3 The actuary also has to remain part of a cost-effective system—to deliver added value on a commercial basis. The recent growth of the consultancy element in the profession may provide the mechanism for many actuaries to get to their own particular specialist coalface. With the prospect of half the U.K. profession soon in consultancies, the pattern of movement may then gradually change. Indeed, in the accountancy profession, the movement for the qualified individual is often away from the professional firm towards a management career in industry.

5.4 Actuaries throughout the world are finding their work affected by the rapid rate of technological and environmental change. However computer literate, this presents them with both opportunities and threats—the ability to do much more via computers than has been physically feasible before, with a concomitant need for techniques to maximise their benefits. At the same time, computers will be providing higher and higher levels of automated calculation and actuarial support functions.

5.5 At an international level, increasing multi-national and cross-border activity is taking the actuary well outside territorial boundaries, and requiring a detailed appreciation of other countries' financial systems and actuarial practices. The IAA has done much to foster exchanges of information to date, and the Groupe Consultatif has shown that rapid strides can be made within Europe in moving towards common standards and mutual recognition of qualifications.

5.6 Determination and hard work will be needed to make common standards and a structured interchange of ideas, personnel and training more of a wider international reality. This needs to be done, since the actuary of the future will not be restricted within narrow national or financial boundaries, any more than the actuarial work will be to which he or she is committed.

5.7 Through the recent strategy discussions, we now have a clear set of U.K.

priorities. The future of the actuary will be a challenging one—but *what kind of actuary* and *what kind of future* are questions which depend on each of us for answers.

6. REPRISE

Some of the questions asked in the preceding sections are:

- 1.6 What will distinguish our profession from others in the future?
What will actuaries be able to deliver at an affordable price?
Will the profession be as dependent on the life and pensions industries as in the past?
How far should we actively seek to unify the profession across international boundaries?
- 2.3.5 How complacent can the actuary of the future afford to be?
- 3.2.5 What questions will the actuary of the future be trying to answer . . . and how many actuaries will this process need?
- 3.3.4 The financial consequences of the actuary being ‘wrong’ through pressure to use central estimate assumptions are likely to be more visible and immediate. The expert will become more and more exposed. How significant an impact could this have on the image of the profession?
- 3.4.3 Even today, we could each ask ourselves how much work in a typical day is in reality based on unique actuarial aspects as opposed to shared skills, how much on a developed ability to ‘see problems in the round’, and how much on practical business experience which is open to good managers from all backgrounds?
- 3.5.7 What price actuaries in the future?
- 3.6.6 How important is the role of the consultant to the future of the profession? Indeed, how independent will the profession itself be in the future?
- 3.8.4 Are we looking widely and deeply enough at what the profession as a whole could achieve outside the more traditional spheres?
- 3.9.3 Where do we stand as a profession on questions such as genetic testing?
- 3.10.6 Which comes first educationally as the specialist coalfaces continue to advance deeper into the twenty-first century . . . more theory or more practice . . . wider skills or more specialisation?
- 4.3 How do we cope with the international information explosion?
- 4.3.4 What is really needed is a more systematic and readily accessible international information system . . . but in what languages and paid for by whom?
- 5.7 The future of the actuary will be a challenging one—but what kind of actuary and what kind of future?

ABSTRACT OF THE DISCUSSION

Miss F. J. Morrison (opening the discussion): I have spent my entire professional career in consulting practice. I am opening the discussion as a representative of the younger Fellows. At 34 I want to look forward to 25 years of being involved with the profession and doing a job which is as broad and interesting in the future as it is now, and not to be sentenced to the technical back room.

In his paper, the author has covered a broad range of issues affecting the actuary of the future. He has not sought to provide all the answers. It is neither appropriate, nor do I have the time, to comment on all the issues, so I shall talk about four topics about which I feel strongly. They are: our image; public relations; Europe; and women in the profession. Some of the things I am going to say will not meet with general agreement, but I am bringing them to your attention because I believe it is essential to tackle them if we are to secure a prosperous future for the profession.

Our image

Let us ask ourselves the question: what do our clients and masters think of us? Could it be summarised as 'a necessary technical evil'? Now, indulge me for a moment while I dream of the year 2001. Imagine actuaries asking the same question. In my dream their clients' answers would be that 'actuaries add value', or perhaps that 'actuaries are creative problem solvers'. Interestingly enough, that second description is one which U.S. actuaries use to describe themselves now.

What is fundamental to my two slogans is that we should not be defensive; we should have confidence arising from our rigorous training. So, the young actuary of the year 2001 will not just talk jargon, nor concentrate on technicalities, nor will he or she be arrogant—just confident. My solution is that we can best tackle our external image from the inside of each individual and the centre of the profession.

Public Relations

The need for better PR has been acknowledged for a long time. 'Strategy for the 1990s' (*J.I.A.* 118, 429) includes as one of its aims: "To raise awareness, understanding and esteem of the profession and to promote a positive image." There are all kinds of reasons why people cannot attend meetings, but it was disappointing that no Council members from the PR Committee were present at E. Short's recent Staple Inn Actuarial Society paper, 'Actuaries and the Media: How to Educate Journalists'.

Many here are members of the Association of Consulting Actuaries, and know the substantial commitment to PR of that organisation. It is because it directly affects their commercial aspirations and those of their firms. However, membership of the Institute also includes many employees of insurance companies, and that poses a challenge to the Council. Council have to convince these members of the need for PR, because it will mean an increase in subscriptions.

We are all aware of the initiative to work closely with the Faculty. If PR is to be tackled jointly, the same financial commitment will be required from the Faculty. We cannot afford to pay only lip service to PR.

Europe

The good news is that half the actuaries in Europe are in the U.K.! We are all aware of the tendency for European actuaries to be more technicians than we are used to being. Because of our numbers, we are in a strong position to take the initiative to bring our European colleagues away from their narrow technical role towards the broader role we have. However, we must not be complacent.

The bad news is the time it takes to qualify here! Because of the shorter training in many European countries, there is a threat from mutual recognition. As the author has pointed out in §2.1.7, the number of new actuaries in Spain last year was more than in the U.K. The solution is a very difficult one, and indeed is against my natural instincts; it is for actuaries to be trained in universities with fewer formal professional examinations. To ensure that we maintain standards, we would need mandatory continuing professional education. Ideally, such a fundamental change would be effected by the Institute and the Faculty simultaneously. However, mutual recognition makes it a pressing

issue, and it would be a mistake for the Institute to delay if there were to be less support from the Faculty.

Women in the profession

If we get everything else right, we will need more actuaries. So where will they come from? Did you know that of those who have been qualified for over 20 years, only 10 out of 700 are women? For some years women have constituted a quarter of mathematics undergraduates in this country, and we get our share of the new students. However, there is a higher drop-out rate among women than men. For example, only one-sixth of the qualifiers this year were women. It would make significant inroads into our supply problem if we could correct that drop-out rate. The change in the education system, which I have already outlined, would reduce the time to qualify, and I believe would help. Other professions have special schemes for women, like the general practitioners' retainer scheme. Should we have a suggested best employment practice for women combining careers and children? I hope that positive steps will come from the working party which has been set up by Council on this subject. However, we have come a long way from the late 1930s, as this extract from a book of the period, *Modern Business Principles and Practice*, illustrates: "In business, there is great scope for women's services. A young woman entering business cannot do better, in order to qualify herself for a job, than to study typewriting and shorthand."

Drawing my threads together; one of the questions posed in the paper in §2.3.5 is: "how complacent can the actuary of the future afford to be?" I would change that to "how complacent can we afford to be now?" On some of the issues I have suggested that perhaps only lip service is being paid, and hope that will not be true of the initiative concerning women in the profession. My comments have been made from a U.K. perspective, and I have identified a threat to us from Europe. The important issue is not for us to have influence for its own sake, but for us to protect the broad actuarial role, and ensure that we are not sentenced to that technical back room.

I have not had time to discuss how we might diversify into other areas, but will conclude with a quotation from Francis Bacon: "A wise man will make more opportunities than he finds."

Mr J. J. Kenna: In §2.3.3. the author quotes a U.S. poll as highlighting that actuaries are narrow and unwilling to look at the broader picture. This is just about right as far as investment is concerned. Property was, until fairly recently, regarded as *the* investment. Arguments such as "Never mind the rents, look at the growth," and "They are not making land any more" were used by actuaries as well as by all other experts and their employers. Then we came to the estate agency and the mortgage indemnity fiascos. It was assumed that house prices would keep on increasing, although the fiscal and financial incentives for house ownership were being cut away all the time. What did the actuaries say then? They said the same as everybody else. "It is a jolly good thing. Marvellous." They are doing this now with share prices.

With a few hiccups now and then, equity prices have been increasing. This is because we have a case of too much money chasing too few shares. The amount of net new issues is nothing like the amount of net new money. Ultimately, shares will be seen to be overvalued. Who, in the actuarial profession, is looking at the broad picture of share prices? Many people are doing a grand job looking at the narrow picture, at individual shares, but who is looking at the broad picture? I think this is something that should be done by the profession centrally and, if need be, paid for by the profession as well. It cannot really be left to people with company responsibilities.

Mr C. J. W. Czapiewski: The last sentence of §3.2.4 highlights the use of actuarial techniques or systems by non-actuaries. Terms such as actuarial methods are often used by people who do not understand all the concepts and processes involved. Actuarial methods necessitate an understanding of *all* that is involved, and are not just technical processes. Some believe that they can enter the data and press a button to obtain an actuarial answer. Perhaps we are guilty by creating, marketing and selling such systems, despite all the warnings that we give when dispensing them. We must reconsider what we do here, because we obtain short-term financial gains and create longer-term problems.

In §3.8.2 there are examples of areas into which actuarial involvement could develop outside

insurance. It also states that some areas inside insurance rarely involve actuaries. This is because actuaries seem to have taken the path of vertical rather than horizontal encroachment into other areas. Relatively few actuaries are involved in directly advising underwriters and brokers. Even fewer have crossed the divide to become full-time underwriters, brokers or claims managers. Certainly, lawyers have not been so restrained in such sideways movements and have often proved themselves successful in such new areas. I believe that the reason for actuaries not moving sideways has traditionally been their short supply compared with demand, and perhaps now we should take off our blinkers and appreciate the opportunities.

I disagree with the use of the phrase 'independent actuary' in § 3.7.2. All actuaries have a duty to their profession and are therefore independent, and the phrase 'consulting actuary' is to be preferred in usage such as this.

The paper also mentions European actuaries. With the freedoms arising in movement and professional recognition between EC countries, we will have considerable problems in maintaining our very high U.K. standards. In some EC countries, a dissertation after graduating is sufficient to gain the status of an actuary. This seems much easier than our 'seven years hard labour'. I do not believe that we should lower our standards, but can we avoid doing so? The opener made a reference to a greater emphasis on a technical university training; I disagree with this completely. I think we need our practical environment.

In § 3.10.2 the paper mentions the options available for the training of actuaries. In the U.K., we have traditionally had a flexibility between actuarial disciplines, but, owing to the growing complexity of actuarial skills, I am not sure how long we can keep up with broad based training. It is an ideal. Can we maintain this ideal? Can an experienced pensions actuary appreciate a new non-life reserving technique or the problems of pollution reserving? Can a non-life actuary appreciate what is happening to pension fund legislation and practice in the U.K. as a result of European court decisions?

Mr C. D. Daykin: I think that the next 10-15 years will see a tremendous development in the role of the actuary in non-life insurance. We have already seen the non-life actuary coming to the fore in Italy and in Finland. Now in Norway and Canada they have an Appointed Actuary role for non-life actuaries, and they are also beginning to consider that in the U.S.A., so I think that we may find we are a little behind the field if we do not move ahead on the non-life side more rapidly than we have been doing up to now.

One of the things which is currently being hotly debated in Scandinavia, is the supervision of financial institutions taken as a whole, and not just insurance companies on their own. Both Norway and Sweden have moved to bring together the supervision of banking, securities markets, and insurance companies, life and non-life, into a single supervisory body. That has risks from the point of view of the actuarial profession, because it could mean that the actuarial input was eventually sidelined and was no longer quite as central as it can be in insurance supervision on its own. I was interested to see, though, that already the Financial Supervisory Authority in Sweden has an actuary on the banking side of supervision. Maybe it is an area where we ought to be seriously considering the future impact of actuaries and how we can develop into providing much greater input, not only towards banking supervision, but also the management of banks, building societies and other financial institutions.

That brings me to the importance of investment. One of the things that comes out most clearly from talking to actuaries from elsewhere in Europe is how the U.K. actuary has a much more developed concept of involvement in investment, looking at the assets side of the balance sheet as well as the liabilities side. There is much debate in some countries, for example in Norway, as to whether the actuary should be a specialist statistician or should have some broader role in economics, finance, investment and financial management. I think the trend is very much in the U.K. direction. We are about to see a much wider acceptance throughout Europe, and possibly throughout North America as well, of the U.K. concept of the financial management of institutions, particularly insurance companies, and, therefore, an essential need to build investment and economics into the training of actuaries. The Swedish Actuarial Society has a meeting this week to decide how they, as a society, can

make additional requirements for the qualification of an actuary, over and beyond the university degree which basically gives a statistical training.

I have a strong feeling that the actuarial world is going to become more international in the next few years. This is something which is accelerating within Europe; but there is also the wider Europe of the European Economic Area; there are the U.S.A. and Canada looking to copy our Appointed Actuary system; there is a proposal that we work together with the Casualty Actuarial Society to develop common standards in non-life insurance. Within Europe, there is not only the possibility of developing the Groupe Consultatif into a European actuarial association, but ideas are coming forward to suggest building up some form of post-qualification education on a European level.

As actuaries, we need more and more to get into the area of language and communication. I suspect that we have been more guilty than most actuarial associations in neglecting the importance of foreign languages, possibly thinking that everybody else would learn English. That is happening, but I think that we also need to learn other languages. If we are to become truly international as a profession we have to give full attention not only to the language in which we communicate, but to the way in which we communicate, so that others will actually understand us. That means that we must not get caught in our own technical jargon, but be able to speak a language that others will understand.

Mr J. Plymen: In §§ 3.4 and 3.5 there are references to traditional activities under threat, one being investment analysis. It says "other specialists now seem to be developing such individual skills well beyond the level of normal actuarial involvement". That is true, but I think that some leading actuaries are playing a considerable part in investment analysis research. To begin with, in gilt edged investment analysis we are absolute leaders—nobody can compete with us. There is a great amount of work going on behind the scenes by actuaries. Investment analysis of equities is a real actuarial activity—studying trends, making up models, looking at the economics. Actuaries should certainly be the leaders of investment thought. Some U.K. actuaries are in that category.

Investment analysts are most remarkable people. At the moment they seem to be largely confined to back offices of stockbrokers and investment departments, but a trained investment analyst, prepared to study long-term trends, is a most valuable character for industry. In the finance departments of major companies, investment analysts study possible takeovers or mergers. Any kind of major business activity needs analysts to study the trends and the likely results. Surely the actuary analyst is better than the accountant analyst in giving more attention to the long-term trends. There is no reason why the real investment analyst, the actuary, should not be the financial controller of a major company. Actuaries should take that part rather than accountants.

In §3.5.2. the author says: "Perhaps saddest of all, the actuary, until the birth of AFIR and FIMAG, let the financial economist have an almost free run of modern investment." I am not sad about that at all. I maintain that modern investment theory, if looked at in a detached fashion by a professional financial expert, is as full of holes as a colander, and has little practical benefit. You do not find any of these modern portfolio theory people being employed in industry for practical work!

Mr N. H. Taylor: In his introduction, the author mentioned supply and demand for actuaries. The latest Needs and Resources Survey carried out by the Careers Committee, which looks at the position 1, 3 and 10 years ahead on a fairly simple basis, suggests that there may be an oversupply of actuaries in those areas where we are currently employed. However, there is an offset in that recent recruitment statistics indicate a significant downturn. It is worth noting that, in the U.S.A., Australia and South Africa there is also concern about oversupply, but there is no such concern apparent in most of Continental Europe, apart from Spain. Perhaps for the first time, a number of actuaries have been made redundant recently, and certainly there are more requests coming to the Chairman of the Institute's Appointments Board for help and guidance. In life assurance there is an expectation of more rationalisation, and I think that the golden years of pension consultancy are possibly also coming to an end. Non-life, however, still looks likely to be a growth area in the future, as Mr Daykin has pointed out. On investment, despite Mr Plymen's comments, we seem to be losing out to others in the valuation of new financial instruments—an area we should have seized on.

Non-life apart, the prospects for traditional actuarial work do not look all that wonderful. However, while there may be short-term disadvantages to some, I believe that the overall effect will be beneficial to the profession. Too few actuaries have ventured far beyond our traditional boundaries; those that have done so have often had specialist skills, been well enough off to take a risk or have reached a senior management position from which they were headhunted. I see no reason why actuaries should not become managers in industry as well as in other financial institutions, such as banks and building societies. Many management skills are transferable, as are many of our mathematical ones. We pride ourselves on our ability to analyse, synthesise and critically evaluate—skills much in demand. In the past, remuneration has been a stumbling block. Certainly, when I was the planning manager of a life office, it was interesting (almost embarrassing) to note how much less were the salaries for equivalent jobs in industry, and this was certainly a role that was very easily transferable. Our image, as the opener pointed out, is another one of our problems, and we will need to tackle that. W. N. Anderton, in his article 'Actuarial Tentacles' (*The Actuary*, March 1991) set out some ideas on how our roles might be developed, but I see even more opportunities.

If we get what I expect to be a slow down in demand for our services in traditional areas, we will be forced into new pastures. I believe that we should accept the challenge and show that an actuarial training provides an excellent basis for many positions. I am sure that the actuary of the future will take on roles far removed from those based on our core skills.

Mr G. F. Chamberlin: In § 2.2.3 the Mission Statement is quoted which talks about "providing expert and relevant solutions to financial and business problems, especially those involving uncertain future events". This statement is so broad, so general and so woolly as to be fairly worthless in determining any kind of future for actuaries. I would expect somebody like a lawyer or a financial economist, or a statistician even, to be in a position better suited to this kind of general statement. I believe that one of the important things about the actuarial profession is its specialisation. In terms of the work it has done, it has been comparatively narrow. That is not necessarily wrong, because the work the profession has done has been extremely successful and extremely beneficial to society.

In § 2.2.1, also looking at the essence of the profession, it says that "One perspective centres around the practical application of the science of uncertainty". That again is too general. Where we have been particularly successful is in looking at the uncertainty of human life; and by applying statistics and by looking at large groups of human beings, we have been able to remove this great sense of uncertainty that the individual has about his own lifespan. We have replaced the uncertainty by certainty, as the motto says. I am sure that actuaries are creatures who much prefer to work with certainty than uncertainty, and there is a deep-seated drive to get rid of uncertainty. In that area we have been very successful.

The third statement is about our underlying financial and mathematical skills, neither of which is unique to the actuary. The foundation of actuarial science is in compound interest and life contingencies. Of course we do not want to stop with just those subjects, we want to branch out beyond them, but these are the roots and the core and are nothing to be ashamed of. The question is: should the profession try to branch out from life insurance and pensions? There is a danger, if we remain completely focused on life and pensions, that we become subject to attack by other professions. It is better to have a dynamic view and to see a wider circle for actuarial work. It is pleasing to see actuaries doing more work nowadays in general insurance and in some of the developments overseas.

Actuaries should be more effective in government itself. Where are the actuaries who should be employed, for example, in the Treasury? Why are there comparatively few actuaries in government service? Looking ahead at the future of the country, we want stability; we want security; we want life enhanced; we want risks reduced—all the things that actuaries are particularly good at. We want, in future, to have a much greater and more profound role in the government of this country and, indeed, of our European partners.

Dr G. D. Kaye: I should like to take up the theme of wastage: of lady actuaries; among male actuaries; and among students.

First, the City University has applied for funding to the E.C. for a pilot scheme for lady actuaries to keep in touch with their profession during a prolonged maternity leave. One of the results will be to combine previous practical training with the more academic expertise of the university. The aim of the project is not only to keep these women in touch with the profession, but also to reorientate them and direct them to where part-time work will become available, and other possibly more unconventional solutions. For example, I know of one life office where there is a husband and wife actuarial job sharing scheme. Certainly, employers need to be educated to take on women part-time, so that women can keep on working once they have had children.

I now consider wastage among male actuaries and among students. For some unknown reason it is considered good for qualified actuaries to go into the wider field. If students do this they are labelled as failures. The skills acquired by part-qualified students are of value to the profession. They should not be treated as failures, but treated as ambassadors at large. For example, a computer consultant who can understand actuarial jargon must be better for the profession than one who does not, and I should like to see this aspect taken up by the public relations side of the Institute.

Mr A. P. M. O’Riordan: As a profession, I believe that we are prone to live in the comfort zone of the insurance and pensions worlds. As the U.S. Task Force poll found, we “are narrow, unwilling to look at the broader picture”. This is substantially true, but not entirely without reason. While we recognise that there are many areas to which our aptitudes and training would be well fitted, we are hindered on a simplistic level by two major factors: first, we are busy and do not have much time to spread the actuarial gospel to other areas; second, we are comfortable, both financially and in terms of intellectual challenge.

Why then, given our comfort and relatively constant flow of work, do we need to develop our profession beyond its traditional boundaries? The answer is at least twofold:

- (1) We have tended to recruit and qualify at a fast rate of late. This is predominantly due, as the author notes, to supply being stimulated by demand. In the cyclical nature of things, however, a large stimulus to demand tends, eventually, to lead to oversupply, followed by a falling off in demand. Some would say that our profession is already on this route. I suggest that we must try to widen the scope of our services, thereby creating new opportunities, in order to prevent the wheel turning full circle.
- (2) We have the ability to apply mathematical techniques to commercial situations, and to produce credible and soundly-based results. This is a virtue which could, and indeed should be, transported to other areas which would find our abilities and insights valuable. However, while our mathematical strengths are undeniable, we need to ally these to broader-based management and communication skills. It is not reasonable to ignore such important parts of an actuary’s armoury in his or her formative years. We cannot afford to leave such development purely to practical experience. Furthermore, as the Mission Statement says, we can provide “relevant solutions to financial and business problems involving uncertain future events”. Critics say that we have tended to mystify rather than publicise the things we do well. Documents intended for public consumption are often less than user-friendly. This may be one of the reasons why we have yet to make a sizeable impact in non-insurance fields.

The author asks whether we should attempt to provide wider skills or more specialisation. I suggest that we should try to extend our knowledge into other spheres and to apply our current skills to those new spheres. I do not propose that we should each seek as individuals to have a wider base of knowledge, as this would put us in danger of weakening our traditional strengths, but rather that the profession as a whole should strive to gain knowledge and experience in new areas. Nor do I suggest that this new knowledge be restricted geographically. Developments in actuarial expertise should not be restricted by borders between countries and continents.

We should aim to widen the awareness and acceptance of the profession in fields other than insurance and pensions, through better communication and demystification of our traditional skills. It is only when we can communicate effectively with non-actuaries that we can expect to become accepted in a wider commercial sense.

Mr R. H. S. Lyon, F.I.A.A.: It is important to remember that tomorrow's actuaries will be more diverse than today's actuaries—as today's actuaries are more diverse than yesterday's. Tomorrow's actuaries will be a product of today's selection and training and tomorrow's standards.

In Australia, as has been mentioned, we are facing an oversupply of actuaries. This is because many of our young actuaries are not perceived to have the ability to add value. They may well have that ability, but their employers do not notice it. This is partly because of the current speed of qualification, which is a product of the move towards university qualification. One reason why actuaries are perceived not to add that value is because they do not have the presentation and communications skills which are required in the modern world, and they are overskilled in technical, particularly mathematical, areas, where many actuaries can now use models developed by those who have a technical bent. The profession is moving away from the highly skilled, mathematical end. As a whole it has to be much more skilled in presentation and communications, interpreting for clients the world in which the clients are operating.

So we must select a different type of person. We should not be telling people that if they are good at mathematics, they will be good actuaries. That is only part of the story; we must also educate them differently. We must look to educating our actuaries at the universities, getting the technical education there, and rely on continuing professional education to give them the skills they need to survive in the wider world. There are two key reasons for that. One is that, although we do not want to perpetuate an oversupply, we also do not want to discourage the people that we want to have as future actuaries. The second reason—which has been touched on by Dr Kaye—is that we should recognise the value of those people that until now we had considered to be drop-outs: the student actuaries who have their six technical subjects—they might even have one or two later subjects. Compared with many people in business, they are extremely skilled and qualified. Yet, we do not call them actuaries. (Some of their employers call them actuaries, and that causes us some problems in Australia.) Perhaps we should do so.

I believe that we will move to other fields. I think that will arise in the short term because of a push from oversupply. With the oversupply some new qualifiers and students will have to move. They will have to settle for lower salaries in the process to make it possible for them to move. That will showcase the actuaries' skills and lead to more demand. If it is supported by PR so much the better.

Our high standards are our competitive edge. We have very high professional standards and we must stick to them.

Mr D. H. Craighead: In considering new fields that actuaries should enter, I am particularly interested in underwriting in the London Market.

There has been a great deal of criticism recently about Lloyd's and the reinsurance companies. It is time that we participated in this field. About 20 years ago, a leading syndicate at Lloyd's asked for a young actuary to study to become an underwriter. There were difficulties about salary. Five applied. Four told the interviewers that they could do the job better than the underwriters could. (I do not think that they knew what they were talking about.) Since then, there have been two student actuaries who were near the end of their examinations when they became underwriters. Today they are highly qualified, very able leaders in their own field and recognised as such. There is at least one other actuary who does a certain amount of underwriting in a limited field and there are perhaps a dozen or so who sit close to underwriters and help them with rating excess loss treaties and with such matters as exposure to claims of a particular group. But that is all.

The difficulty is that, if young actuaries move into this field, they will still have to study for years in a new discipline, even though they can bring to it great gifts from their actuarial studies. It will be, perhaps, some time before their salaries equal what they would have received in the traditional areas of actuarial work. Ultimately, the rewards are greater. If one can foresee the time in 30 years from now—and probably no earlier than that—when there are up to 500 actuaries who are underwriters at Lloyd's and the London Market, then one hopes that there will be less criticism of that market, which will be immeasurably stronger and able to play its full part in the financial world.

Mr T. S. Shucksmith: When I think of a professional person, I think of one who has acquired a skill of an esoteric nature based on scientific or other objective knowledge. This skill is acquired following

higher education, through vocational education and training through practical experience. Ability in that skill is tested by examination. Typically, I would expect professional persons to be practising their skills throughout their working life. Most lawyers, accountants or doctors will be practising their core skills until the day they retire. It seems to me that actuarial skills of this nature can be identified, and those set out in §4.2.1 originating from the German Association, and the actuarial techniques set out in §2.5 of the Institute's recent consultation document on the education and training of actuaries, represent a fairly comprehensive and clear description.

It is evident to me that there is a distinction between actuarial and management skills, which people seem reluctant to recognise and face up to. Typically, members have said, "As a manager" (not as an actuary), "I took decisions or took action." Management skills do not satisfy the criteria for a professional skill which I have just described. When some lawyers or accountants leave their professional firms for careers in commerce or industry, they are spoken of as "leaving the profession". There is nothing wrong in this; management is an extremely important function and is in no sense dishonourable.

The Institute should, however, recognise and accept that management skills and professional skills belong to distinct different categories within the economic system as a whole. There may be a tendency for actuaries to lose out in the top management of insurance companies. One response is to attempt to enhance the commercial, marketing and management skills which actuaries employed in those companies acquire. This is not, I feel, the job of the Institute. Another response, and I believe the better one, is for actuaries in their professional function to aim for independence from the management function. In this area, the Institute can give a vital lead and encouragement.

An issue which the paper completely avoids is that of the capacity in which actuaries will exercise their professional skills in the future. By this I mean whether they will be contractually responsible for their advice as proprietors or partners, or whether they will render actuarial services to customers of their employers and, if so, what will be the ownership of those employers. This is important for the public. It is relevant to note that the Institute of Chartered Accountants has stipulated in their rules that at least 75% of partners or shareholders in an audit firm should be qualified accountants. According to a *Financial Times* report, the Law Society supports the accountants' view that restrictions on ownership and control are essential to the independence and integrity of the audit function. Is this any less so for many actuarial functions? Are they any less important? I should like to think not. However, the actuarial functions are more esoteric, more uncertain, less susceptible to objective testing and relate to areas where vested interests are rampant.

From the point of view of members of a profession, the issue of capacity is important. What most professions, worthy of that description, offer to able people of integrity, who are capable of acquiring and practising professional skills, is the opportunity to be their own master as a proprietor or partner. Many such people are not interested in gaining and exercising control over other people. Why should they be? Why, therefore, should such people be controlled by management, with who knows what loyalties or philosophies and ultimately answerable to who knows what owner? To ignore the issue of ownership, and not to recognise the distinct nature of contractually direct services, is to deny present or future actuaries their proper professional standing, not a standing superior to management status—just different.

In his recent history of the Association of Consulting Actuaries, R. W. Abbott referred to the 1972 Code of Conduct and the different rules applicable to direct and indirect advice. He remarked that the distinction, however reasonable and logical, was greatly resented by many employed actuaries. I do not believe that the 1984 Code of Professional Conduct does, or can, abolish the distinction between contractually direct and indirect services, although it appears to be thought by many that it does. What is clear is that the new code was born out of resentment. It is an unworthy parent, which has led to an anti-professional situation, a situation which runs counter to an objective of actuaries having the right to control their own work.

Professor A. D. Wilkie: What can the Institute or Council do about the actuary of the future? It is not really possible for the Institute to instruct younger actuaries to get jobs in the wider field. That is up to them. It is difficult to know whether encouragement or discouragement from Council would make any difference.

At the 40th anniversary of the Association of Consulting Actuaries recently, one of the past Chairmen was talking about life as a consulting actuary in the 1950s. At that time, a substantial amount of the work of friendly societies had just been taken over into the National Health and National Insurance Schemes. It seemed to some consulting actuaries at the time that there was no future in consulting. It is easy to make the same sort of mistake again. Remember the *Barber v GRE* judgment—pensions are part of pay. At some time somebody will raise the point that it is odd to pay people according to how long they live in the future, or when they die, or how many dependants they have. If people want to buy insurance provision like that, can they not do it privately? Is it any job of the employer to supply pay in that form? What then happens to pension schemes?

Life assurance as a savings medium was encouraged for many years by tax relief until 1984, when life assurance premium relief was abolished. Now, the heavy costs of life assurance as a savings activity rather show up. In recent years we have seen PEPs and TESSAs introduced. The next step for the Chancellor would be to go into a full expenditure tax structure, allowing, in effect, pension fund taxation systems for any form of individual savings. Even if life offices were to move on to a gross tax basis, would not individual savings become substantially more attractive?

Without pensions and life assurance, what is left? There are general insurance, finance and investment. There are plenty of actuaries involved in banking in France.

I do not agree with Mr Plymen when he says we have nothing to learn from financial economists, we have a great deal to learn from them.

I am concerned that the mathematical standard of various papers I have seen presented in other actuarial bodies has been rather poor. Why is it that we take good mathematics graduates and then spend four or five years knocking all their mathematical knowledge out of them? People have already said that the high ground of actuarial work is actuarial mathematics: compound interest and life contingencies. Others can and do compete in management, others can and do compete in investment and others are much more mathematically minded in statistics than we are, but we do need to retain somewhere in the profession this combination of good and sufficient mathematics combined with the ability to apply it. I take the point of Mr Lyon that it may be sufficient if some people have that mathematical ability and other people are able to interpret it, but if we do give that up, then we are no better than MBAs or CAs, and there are many more of them than there are of us.

There are those who have spoken as if the continental actuary is merely a good technician. Some of them are very good technicians, and also some of them are responsible in management, much as actuaries are here. There are many fewer of them in general on the continent than there are here, so that is one field of possible expansion. I suggest that we should institute some sort of investigation into what the real role of actuaries is, and their standing in life companies in other countries. We might be surprised at the results.

Mr J. A. Geddes: In §1.1, the author refers to the influences that have affected the development of actuarial practice in the past. I would add one more. This is the change during the early 1980s when the professions were required to alter their rule books to permit advertising and to remove other restrictions on competition. That was a profound change and heralded a reduction in the previously very clear distinction between professional and other commercial and trade activity. The author writes that the training and development of actuaries today will influence the standing of actuaries well into the 21st century. In following this through we need to bear in mind that today's environment is very different from that in which our own training and development took place, and from which the standing of the profession today sprung.

In §2.2.1, the author states that opinions vary as to where the essence of the profession lies between three different perspectives: "the practical application of the science of uncertainty"; "the actuarial involvement with financial security systems"; and "the synthesis of underlying financial and mathematical skills". I suggest that these are not alternatives, but are each and all essential elements of that 'essence'.

I am unhappy about the wording of the Mission Statement in §2.2.3, by the concept of developing the role and enhancing "the reputation of the actuarial profession in providing expert and relevant solutions to financial and business problems", especially when we are reminded in §§3.4.1 and 3.4.2, and realise that there are other experts solving these problems as well. I believe that this would be

better expressed as "providing necessary specialist and expert input for the solution of those problems". We surely have no exclusive expertise to provide the whole solutions.

Turning to §3.10.6, I offer an answer to one of the questions that the author has asked: "But which comes first educationally as the specialist coalfaces continue to advance deeper into the 21st century . . . more theory or more practice . . . wider skills or more specialisation?" I believe that it is the profession's job to ensure, so far as possible, that practice does not proceed ahead of theory. Individual actuaries, whether they are in management or whether they are entrepreneurs; whether they are wealthy or whether they are poor; will develop practice to the frontier of, and perhaps beyond, the theory. It is their right to do so and to incur the business risks involved, but the job of those actuaries who are practising professionally and of the professional bodies which nurture them, must be to concentrate on ensuring that the theoretical groundwork is in place for the entrepreneurs among us to build their practices on.

The other part of the question in §3.10.6 is "wider skills or specialisation?" Some speakers have described the wider range of activities that we may move into, and the difficulty of keeping up with the development of the existing traditional roles. Any wider skills will surely only grow out of increased specialisation, which will in any event be necessary to provide the theoretical underpinning needed to distinguish our professional functions from our commercial activity.

We must, above all, pursue excellence, and if this means more specialisation, then so be it. It follows that the professional bodies have a duty to resist any widening of the scope of our activities which new commercial pressures now demand, if and whenever such widening carries a risk of reducing the quality of professional standards.

Mr P. N. S. Clark: The opener contrasted two possible images of the actuary: that of a necessary technical evil; with that of a creative problem-solver. There are a number of individuals or groups that one tends to blame for our poor public image: the Council; the Public Relations Committee; the Careers Committee; the Faculty; and if all else fails, the Chartered Accountants. Might it not be time to blame ourselves? Mr Lyon discussed the need for presentation and communication. I think that many of us, for want of spending time on presentation and communication, end up marginalising ourselves, and then nobody takes us seriously. But the blame is ours.

To quote from R. H. Ranson's recent letter to *The Actuary* (September 1991), "the status of the profession depends upon the quality of the people in it".

Mr P. D. G. Tompkins: Much of the talk within the EC these days is about whether it should become wider or deeper. I think many would agree that some of the rush to deepen it is too hasty; that the widening of Europe is much more important than the narrow deepening of the EC as it is. I shall now consider three areas which I think the profession should be looking at widening: education; specialisation; and recruitment.

Education

There has been a fear expressed that one of the dangers with which we are faced is that other European actuaries qualify a great deal more quickly than we do. The time to qualification in some other countries is very much shorter than it is here. Are we not running the risk that people are going to find it easier to qualify elsewhere and then to come here? Is there a danger of what one might call the 'flag of convenience' problem? Are the qualification standards the same in other countries as they are here? It is very important that the profession looks across the actuarial community both here and overseas at what an actuary is. The common standards on actuarial principles for life insurance are a very positive step forward taken by the Groupe Consultatif. Here there is a strong role to be played in examining the educational basis of actuarial training in the different countries, to agree on common standards to ensure that perhaps we are not doing more than we need to identify actuaries for future consulting advice or for future work within life assurance.

Specialisation

We do not want to make our training too detailed and too precise in areas where people's skills from

their experience are much more important than book work. Long experience of being an actuary is much more important than having studied the details of particular practices at the time when you were taking the examinations. We need to concentrate on the basic core, and allow the widening of the specialisation to develop from that. We must not lose sight in our education process of the facility to introduce other areas of specialisation, as and when they might develop, on the basis of the market forces which will be driving actuaries to develop them.

Recruitment

Is our recruitment wide enough? When demand is far in excess of supply, a profession will spend substantial effort in trying to promote itself. It will tour universities and schools, and will try to see that people are made aware of what an actuary is, in order to recruit the large numbers of students that are needed. There is a danger that, if the supply is beginning to exceed demand, one might slacken on one's preaching to the unconverted when meeting students at schools and colleges. I do not want to see us leaving the publicity of our profession to others, because we feel that there are enough coming through. That way we will end up with a much more concentrated Oxbridge type intake, and one wants to avoid that. The distribution of actuaries should be as wide as we can possibly make it to give more life to the profession, more breadth to the advice we can give.

Mr F. E. Guaschi (closing the discussion): I wonder whether some of you, like me, have found yourselves rearranging the words of the title into "The Future of the Actuary". In recent years I have, from time to time, thought much about the future of our profession, even to the extent of asking myself whether, in the long run, we have a future. This is not in a morbid or despairing sense, but considering what we have to do to ensure that we survive and flourish in ever wider fields—a phrase from F. A. A. Menzler's inspired remarks at the Annual General Meeting of the Institute in 1924 on the subject of "Expanding the Scope of the Profession" (*J.I.A.* 55, 305-7).

In examining the financial environment which we now inhabit and the effects upon those professions which operate in it (accountants and lawyers, for example), it is clear that the ever-growing numbers of critics in government, press, television and radio, and consumers associations are subjecting the activities of those professions to a much closer scrutiny. No bad thing, you may think, and I agree, but it does mean that we have to adapt what we say and do to a much more sophisticated public.

Accountants and lawyers, together with a growing army of self-styled financial advisers, are giving advice in areas which, for many years, our profession has regarded as its own particular territory. For example, it is not uncommon for a television programme dealing with pensions not to have an actuary present. This, on a subject which relates to the longest of long-term business, and which contains financial dangers and implications which are often not even glimpsed by some of those speaking. Witness some of the ill-conceived remarks made by some politicians promising bigger and better old age pensions. Do we perhaps need to resurrect 'National Pensions, An Appeal to Statesmanship' of May 1959 (*J.I.A.* 85, 293)?

The biggest problem, which is still with us, is that many ordinary people have never heard of actuaries, and of those that have, there is still an irritatingly high percentage who think that we inhabit a rarefied world which they pretend they do not understand. I think that the future of actuaries depends in large part upon our abilities to overcome this ignorance and survive as a clearly identifiable profession in our own right. People have to be able to say that for such and such a problem, the actuary is the obvious person for the job. Too often I hear them say, "Oh, is not that a job for an accountant?" I agree with Dr Kaye that we should make better use of actuarial drop-outs. In my former firm, a large reinsurance company, we had a number of these people who reached very high positions in the company. We used to call them unqualified successes.

The author's remarks at the end of §1.3 "Yet for some reason actuaries are generally an easily recognisable species, whatever their habitat", has to be translated into a much more powerful image for the intelligent person on the Clapham omnibus. It is no good merely being recognisable to each other.

In his presidential address in 1950, F. A. A. Menzler drew attention to the fact that the employment of actuaries beyond the traditional boundaries was no new thing (*J.I.A.* 77, 1). In a Students' Society

paper on the 'Wider Field' in 1954 (*J.S.S.* 12, 208), written as a result of Menzler's stimulus, F. H. Spratling wrote: "The fathers of the Institute were cultivated men of affairs who also commanded respect and made major contributions to knowledge and achievement in other quite different fields. There was a strong body of opinion in the early days of the Institute that actuaries not only could but should apply themselves to matters beyond the range of life contingencies. In this connection, the work and writings of men of such stature as John Finlaison, our first President, and Dr Farr, the pioneer of vital statistics come to mind." Those words of nearly 40 years ago float across time like a breath of fresh air today, but they also ought to challenge us anew when we consider what has happened in the intervening period.

The recent surveys on both sides of the Atlantic mentioned in the paper have had the drawback that we have asked ourselves what kind of people we think we are. Whilst this can take us some of the way towards the desired evolution into the actuary of the future, we have to discover what non-actuaries think and expect of us. The author draws attention to what I regard as our greatest danger, complacency. He asks, 'How complacent can we be?' The answer, I strongly believe, is 'not at all'. The surveys which have been made, although somewhat introspective in nature, should give us some clues as to what action is required of us. This was particularly stressed by our opener—especially the need to work on our public relations.

We have, in the past, exercised a strong influence on problems involving national pensions, especially when the subject was a kind of political football. As the author states, we must be aiming to play an important, and what is actually our traditional, role in the public debate of social security, pensions and the health care needs of an ageing population. It must be for us to bring to public attention, without taking political sides, the long-term and serious financial implications of any proposals.

We have had a long history of interest in computer applications to our problems. We were rather slow in starting to apply them, but we caught up. I agree with the author that they pose both opportunities and threats for us. Computers are marvellous for number crunching, but we must use our skills to transform the problems which we are asked to solve into user-friendly answers in the English language. As we have been warned, we must not have any sausage machines where data go in at one end and garbled actuarial garbage comes out at the other.

The author has drawn attention to the rapid growth in the number of consulting actuaries over recent years. There is no doubt that this has led to an expansion into wider fields, and it is to be hoped that this has served to bring the profession into greater prominence and to promote an increased understanding of what actuaries are capable of. Mr Daykin pointed to non-life as a growth area, and the need not to fall behind other European actuaries in this field. The author asked the question in §3.8.4 as to whether we are "looking widely and deeply enough at what the profession as a whole could achieve outside the more traditional spheres". It is almost one of those questions that answers itself. I am sure we are not paying enough attention to this, and this has to be brought into the training of the future actuary.

On the subject of training, the author rightly points out in a telling sentence in §3.10.1 "Education has to be based on a vision of required future skills." It reminds me of how one gets a rocket to the moon. You have to send it towards the spot where the moon will be when the rocket gets there.

Several speakers have drawn attention to the conflict between the need to have a shorter qualifying period and the need to maintain standards. Mr Lyon also reminded us of the important process of selecting the right people to become actuaries of the future. Education means not just that which will be provided by actuarial education services; it begins in the organisations where the students find themselves. Their older colleagues are part of that education process. It continues for life. There is no one here too old or too experienced to learn something about the means of evolving into the actuary of the future.

On the international front, we have a long and honourable history of active participation in international congresses and other international gatherings. The Institute and the Faculty are rightly regarded by other actuarial bodies as models. Here is what Harald Cramér, the eminent Swedish and international actuary, had to say in a talk given in this Hall in 1963, about the lines of activity being pursued by actuaries at the time, including general insurance: "All over the world, actuaries look with profound admiration at the great work that has been laid down on these lines in Great Britain during

more than a century” (*J.I.A.* 89, 95). If that does not tell us that we have to remain outward-looking and international, nothing will. We have a tremendous amount of knowledge, experience, and above all, integrity, to give, and we must demonstrate it to the wider actuarial world.

In conclusion, we must remember what the author asked in Section 3.5: “What price actuaries?” I leave you with the thought that our advice must be worth what we are being paid for it. As the opener said, actuaries must add value. Otherwise, we shall find ourselves redundant. Mr Taylor’s warnings should be heeded.

We are usually portrayed as solvers of complex problems; but this is nowhere near sufficient, even though it is necessary. The actuaries of the future will have to be able to help clients determine what their problems are, and to communicate the answers in a language which the clients understand—that is, their language, and not ours.

The President (Mr H. H. Scurfield): Two weeks ago we entertained in this Hall Presidents and senior representatives from actuarial bodies from 17 different countries. Some I had met before, others I had not, and many had not met each other, but it was interesting to see how quickly the bonds of friendship developed. It was for me a powerful example of the quotation at the head of Section 4 of the paper: “There’s no such thing as strangers, just friends you haven’t met yet.” It was clear at that meeting, when we discussed the paper, that around the world the profession is facing many of the same issues. There was a will to learn from each other’s experiences, and the debate will continue in Montreal next year. It will continue too, I hope, in Germany shortly where Mr Martin Baller is aiming to arrange a meeting of German and British actuaries, because they want to understand our system better.

In Canada and Australia, where universities are playing a large part in the education of the actuary, there is developing a surplus of actuaries and the professions there are looking actively at the wider field. Good! But I believe that we need to consider the underlying issue. The actuary does, I believe, bring some special expertise to bear, in particular to uncertain financial problems. There are many other experts who cover some of the same ground as we do, but we are unusual in covering such a wide field of expertise, albeit within a narrow field. We are better able than most, or indeed any, to synthesise the whole, but we have a weakness in our ability to communicate that whole. I see this as one of the biggest barriers in the profession’s ability to reach out into wider fields. I should like to see our education, prior and post-qualification, giving more emphasis to this, either by the employer or indeed by the profession. I was sorry to see this subject was not brought out fully in the paper. For me, this was the only flaw in a very timely, challenging and useful paper. The full discussions, both tonight and two weeks ago, have clearly demonstrated its value, and the appreciation of those who attended. Thank you Mr Akhurst. I ask the meeting to show its appreciation.

Mr R. B. Akhurst (replying): I will highlight two points that are very important. The first is the need to look very hard at the use we make of the preliminary degree that we ask actuaries to take. I have a feeling at the moment that that could be put to better use in taking the actuary through the preliminary training. I very much sympathise with the sentiments of Mr Geddes that the hallmark of the profession is one of the pursuit of excellence.

One of the major challenges in the U.K. and elsewhere is not just in widening or deepening the profession, but also in bringing in the multi-national and the cross-border influences and activities that are going to be with us increasingly in the future. I think the key is to look at what is common in actuarial professions world-wide. This is what the Groupe Consultatif has done very successfully. The success that it has had in influencing the course of European legislation evidences how a combined profession can have a greater say in the world than single voices by themselves.