B.A.J. **2**, II, 325–427 (1996)

THE FUTURE OF THE PROFESSION
A STUDY LOOKING OUT TO 2005 TO IDENTIFY CHALLENGES FOR THE PROFESSION

[Presented to the Faculty of Actuaries, 20 November 1995,
and to the Institute of Actuaries, 22 January 1996]

ABSTRACT

This is a study into the future of the actuarial profession. Its main purpose is to assist the United Kingdom profession to respond effectively to the changes and opportunities of the next ten plus years. Scenarios are developed to show where the profession could progress to in that period; the major changes and developments implied by these forward views are identified and actions to take the profession in the desired directions are proposed.

The study covers the key issues relating to most of the various business areas in which actuaries practise, and considers, in particular: the future supply of, and demand for, actuaries; actuarial education and training and relations with other professions.

KEYWORDS

Actuarial Profession; Future; Education

THE REPORT

INTRODUCTION

1. The Institute Council invited Mr Paul Coombes, a Director of McKinsey & Company, to a full day meeting on 26 September 1994. He opened a discussion period on the Future of the Profession. Subsequently the Faculty Council also discussed the presentation and added their views to those of the Institute Council.

2. In broad terms the Coombes' proposition was that:

2.1 Developments in the market place and within the profession pointed to a need for a reappraisal of the profession's future role.

2.2 There were probably four options for future development:

(1) retrenchment to tight actuarial skills backed by national legislation;
(2) hard encroachment — aggressively moving into new areas;
(3) soft encroachment — encouraging the employment of actuaries in areas not necessarily the historical province of the profession; or
(4) relaxed, self-confident permeation — a looser version of soft encroachment, whereby the profession accepted that individuals and firms would move to areas of their choice, limited only by their own skills and experience.

2.3 Any study of the profession's future role should start with an honest self-analysis.

3. Both Councils took the view that retrenchment and hard encroachment were not recommended, and that a combination of soft encroachment and relaxed self-confident permeation was the preferred option. The two Presidents set up a study, *The Future of the Profession*, in December 1994, to examine the potential roles of actuaries in the next 10 years. The terms of reference of the study are at Annex A and the composition of the team is at Annex B.

4. This report is the major part of that study, and was considered by both Councils on 25 September 1995. Councils welcomed the report and decided to encourage discussion within the profession on many of the points that it raised. The report was to be discussed at various conferences over the winter 1995/96 and by local actuarial associations. A Faculty Sessional Meeting was scheduled for November 1995 and an Institute Sessional Meeting was scheduled for January 1996. Ideas or comments were asked for, and could be sent to the secretary or to any of the study team listed at Annex B. Councils intend to revisit the report in about May 1996, and set out the necessary follow-on actions.

AIM

5. The aim of this report is to assist the United Kingdom actuarial profession to respond effectively to the challenges of the next 10 years.

CONCLUSIONS AND RECOMMENDATIONS

6. This report is set out in sections and each deals with a particular sector (general insurance, etc.). These sections contain considerable points of detail, with future problems and ideas that have not been covered in these general conclusions and recommendations.

7. *THE PROFESSION TODAY*

The profession today is in reasonable health; demand is growing steadily in pensions and rapidly in general insurance. Life assurance demand is flat. The profession is rightly concerned about its education and training processes, and whether they are effective and will meet tomorrow's requirements. Action is in hand to address these issues. The age distribution reflects that of an expanding organisation.

8. *FUTURE SCENARIOS — OUTSIDE INFLUENCES*

The profession thrives on sufficient freedom to design and service products tailored to the needs of the market. The profession would be affected adversely to a considerable degree by:

(1) the introduction of a compulsory pensions scheme that, in time, would replace

the many existing schemes;

(2) a major state involvement in the way that long-term care is managed — linked with pension provision or other means in a prescribed way; or

(3) a major change in the regulatory detail in the financial sector leading to the removal of freedom on product pricing and design — this scenario is mentioned, but not developed.

9. *Future Demand For Actuaries*

9.1 The future demand for actuaries is sensitive to small changes in the life and pensions sectors. These two employ more than 80% of the profession.

9.2 Based on the team's expected demand in each sector in 2005, the future, in terms of numbers of Fellows, will be:

— *Life* — unchanged at 1,500;

— *Pensions* — after a significant increase from the present 1,100 a fall back in demand by 2005 to produce only a modest increase to 1,200;

— *General Insurance* — an increase from about 210 to 400;

— *Investment* — little change to the present figure of about 220; however a longer-term increase may occur;

— *Health and Care* — a steady possible increase from about 25 to 200; and

— *Wider Fields* — a possible increase from 25 to 100.

These figures were selected from a band ranging from minimum demand to maximum demand.

9.3 The total expected demand will be more than met by continuing the present recruiting levels at about 250 p.a. This will produce 3,916 Fellows, as against the expected demand of 3,550. This assumes that the present time to qualify and low pass rate continue.

9.4 In the maximum demand scenario the profession would be unable to recruit sufficient students. A radical new approach would be required.

9.5 It is almost certain that significant numbers of actuaries will need to move across sectors to maintain employment. To some extent reduced demand in one sector will tend to encourage moves towards a more dynamic sector.

9.6 There may be a latent demand in the wider fields area, but it can only be tapped once actuaries have proved their worth in each field.

9.7 The figures we have used are a matter of judgement, and additional discussion and opinion from the profession is welcomed. We have produced a flexible model of supply and demand which can be used now and in the future to model progress.

9.8 It is expected that more U.K. qualified actuaries will be working in the United States of America, continental Europe and Asia. As a counter balance, more non-U.K. qualified actuaries are likely to be employed in the U.K. The net effect of these movements will, in part, depend on the extent to which the U.K.

qualification is relevant to other markets. No quantification of this has been attempted.

10. *SKILLS REQUIRED*

10.1 The work that actuaries are likely to do in 2005 in each sector is discussed, and the necessary skills deduced. The following is an overview of the required skills balance.

10.2 *Additional or Enhanced Technical Skills*

— stochastic modelling of investment and other risks;
— financial condition reporting — comprehensive, comprehensible reporting on the present and future health of the insurance industry;
— a better broad-based understanding of risk and finance, including accountancy issues;
— the use of current actuarial tools to solve a wider range of financial and business problems; and
— a better understanding of investment vehicles and financial economics.

10.3 *General Business Skills*

— project management;
— report writing — (written communication in non-technical language); and
— interpersonal skills — and ability to work more effectively with non-actuaries.

10.4 There was a belief that the present actuarial skills are somewhat narrowly focused for certain sectors, and not developed and promoted as general tools.

11. *EDUCATION AND TRAINING*

11.1 The present large hurdle to Fellowship, with its detailed examinations in some subjects, acts as a restriction to those who might want to use Fellowship as a starting point in a general professional financial career. It can also deter recruits who have little to show for their efforts if they fail.

11.2 A new level of 'standard' qualification could be valuable, as it would increase the mobility of the profession both internally and into new areas. A 'standard plus' qualification could follow, to provide the special knowledge required for particular work in a chosen sector (e.g. life, pensions).

11.3 Irrespective of any new qualification, the present examinations syllabus should introduce practical problem solving at an earlier stage, and examples should be drawn from a wide range of applications.

11.4 CPD will play an important part in maintaining the effectiveness of the actuary throughout his or her career.

11.5 In 2005 world markets will be more inter-dependent. The emphasis of

initial education should be on skills and methods which have general application. Specific knowledge of individual jurisdictions and markets should be the subject of additional modules. In this way, the U.K. qualifications should have general application to most countries' markets. Conversely, other actuarial qualifications are likely to attract applications from the U.K.

12. *OTHER ISSUES*

12.1 Competition and co-operation with other professions is welcomed. The actuarial profession must maintain its position by setting the highest standards, and by adjusting its education and practical training to show that it alone is best suited to certain work.

12.2 Multi-disciplinary practices will continue, and are healthy for the profession. They will increase the cross fertilisation of ideas, and, if the profession continues to evolve to meet future challenges, it will show that it has a unique contribution.

13. *RECOMMENDATIONS*

13.1 Recommended actions (in addition to the many smaller points set out for each sector) are:

(1) Improve the collection of regular statistics on the profession to identify more clearly where actuaries are employed.
(2) Increase emphasis on stochastic and other methods over deterministic approaches.
(3) Consider the value and desirability of a new 'standard qualification' followed by a 'standard qualification plus', which would require the passing of one or more modules from a range of more specialist qualification modules.
(4) Consider how the examination process can be improved to introduce problem solving and report writing skills progressively. Postponement of detailed market-specific knowledge should enable a reduction in basic qualification time to be achieved at the same time as improving the skills base.
(5) Set in hand the necessary arrangements to meet the likely demands for re-training and additional training.
(6) Make the annual updating of this report the responsibility of a specific committee. This should consist of the updating of the factual database and the consideration of any new information on likely demand trends in the various areas of actuarial employment.

METHODOLOGY

14. The team accepted the Coombes' presentation and the Councils' broad guidance as the starting point, and did not formally revisit any of the options that

had been set aside. Nothing emerged during the many discussions that would suggest that retrenchment or hard encroachment should not have been rejected.

15. Many commentators, academics and others (e.g. FT Financial Services Report, Project Technology Foresight) have produced predictions for the financial services sector over the next 10 or 20 years. The team reviewed these, and debated, at length, the value of such a broad approach against examining the future in more traditional sectors (life, pensions, investment, general insurance, wider fields, etc.). The latter course had dangers of a possibly blinkered approach to wider developments, whilst the former could lead to a less than profitable essay on future trends that would be difficult to translate into the practicalities of actuarial work. On balance, the team favoured the sectoral approach, but viewed each against some general trends leading to the overall implications for the profession.

16. The whole study started with a self-analysis to set out, briefly, how the profession had reached its present position, its size and shape and its perceived strengths and concerns. This self-analysis did not go to the depth that Mr Coombes suggested. He recommended a fundamental look at skills, with a detailed analysis of which skills were most used and what value an actuary could bring to a business. The team did not reject the logic of such a rigorous approach, but decided, instead, on a more incremental approach.

17. In preparing this report, the team was grateful for the quickly prepared, but strong, views that came from many of the local actuarial societies.

THE PROFESSION TODAY

18. *HISTORY*

18.1 The history of the profession is well documented, with its roots essentially in life assurance. It has grown steadily, developing its skills to suit complex financial products in life assurance, pensions and employee benefits. Work closely associated with these areas has also fallen to actuaries (e.g. life company investment departments).

18.2 The areas of general insurance, health insurance and reinsurance are increasingly attracting more actuaries, as they are self-evidently subjects where actuarial skills are valuable. On the other hand, actuaries are not as prominent in banking and unit trust business or equity fund management (outside life companies), where many believe the profession should have a role.

18.3 Internationally the U.K. profession is well known and respected for its venerability, length and depth of training and rigorous approach to problems.

19. *GROWTH MODEL*

19.1 Within the U.K., actuaries have established themselves in certain sectors before moving gradually into adjacent sectors. In many cases this establishment has been achieved by a combination of legislation (e.g. Appointed Actuaries and Pension Scheme Actuaries) and the authorship of a particular reference document/methodology (life tables, pensions decrement tables). This model is illustrated schematically in Figure 1.

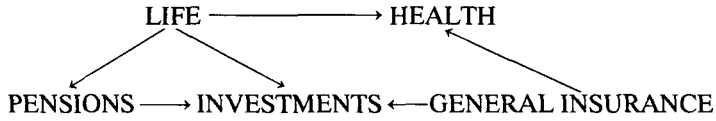

Figure 1. Growth model

19.2 There is very little evidence of many actuaries straying far from the areas of work mentioned so far. Hence, in anticipating where the profession is going over the next 10 years, we have concentrated on the prospects in areas that it presently serves and the opportunities which may develop to extend into adjacent areas. Large leaps cannot be discounted, but they should be viewed realistically.

20. *PRESENT SIZE AND SHAPE*

20.1 The team was disappointed to discover a lack of consistent historical data covering the Institute and the Faculty over the past half century. One of the firm recommendations from this study is that such data should be recorded henceforth. Figures 2 to 8 illustrate the development and present size and shape of the profession. Some care should be taken in using the detailed figures, as some are for both the Faculty and the Institute and some for the Institute only. However, they give a realistic picture overall, and the team spent much time ironing out many areas of inaccuracy.

20.2 It will also be desirable to redefine the employment categories to identify more clearly what people are actually doing. In particular, investigation of categories such as 'management' and 'other' revealed an under-recording of those effectively involved in life assurance.

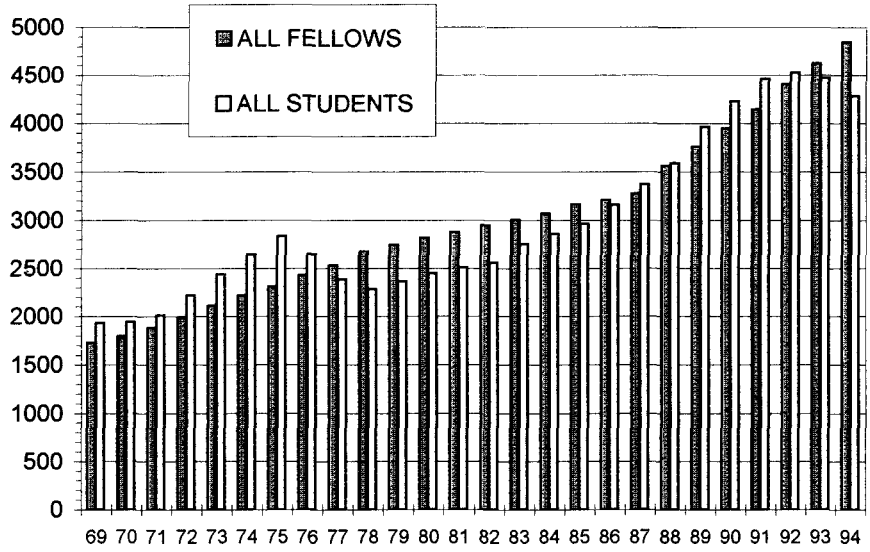

Figure 2. Numbers of U.K. and overseas members (Institute & Faculty)

Figure 2 shows the growth in the profession over the last 25 years. With qualified actuary numbers growing fairly steadily at around 4% p.a. from 1,750 to around 4,800. Student numbers have grown slightly more slowly, with peaks in 1975 and 1992. These peaks could be explained as a lagged effect arising from the end of the 'boom' periods in 1972 and 1987. If so, it may indicate that students decide to become actuaries at the start of their university career rather than at the end, or that employers are slow to react to changing circumstances. Either way, if this lag exists, it means that the supply of actuaries will adjust very slowly to changing circumstances (say a lead time of 4 years on student recruitment, and 5 years to qualify). Alternative explanations might provide other insights.

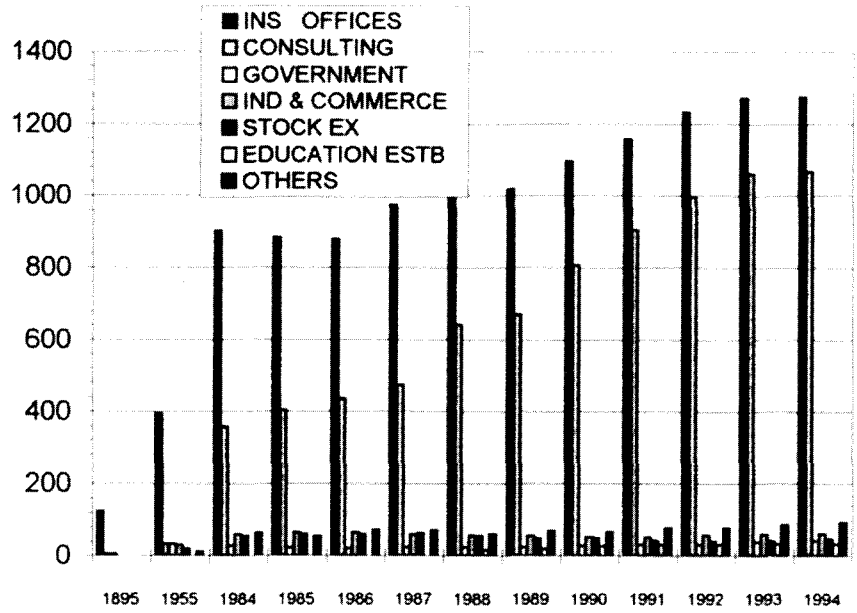

Figure 3. Numbers of U.K. Fellows (Institute only) by main employer

Figure 3 illustrates the extent to which the growth of the profession has been accompanied by a rapid growth in employment in consultancies compared with a much more modest growth in insurance office employment.

In Figure 3, for each year, the left column gives the numbers employed by insurance offices, continuing through the above list of employers to 'Others', given by the right column. (Note that Figure 3 was originally produced in colour.)

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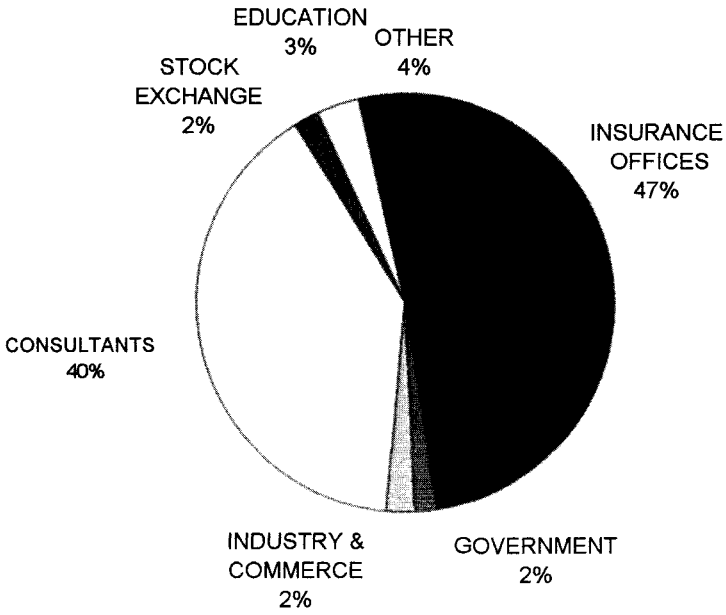

Figure 4. U.K. Fellows (Institute & Faculty), by employer, 1994.

Figure 4 shows that by 1994 40% of actuaries were employed by consultants compared with 47% employed by insurance companies. A large part of the explanation of this move lies in the growth of pension schemes and their assets over this period. A secondary cause has been a move towards life companies using consultants rather than in-house actuaries on life assurance work.

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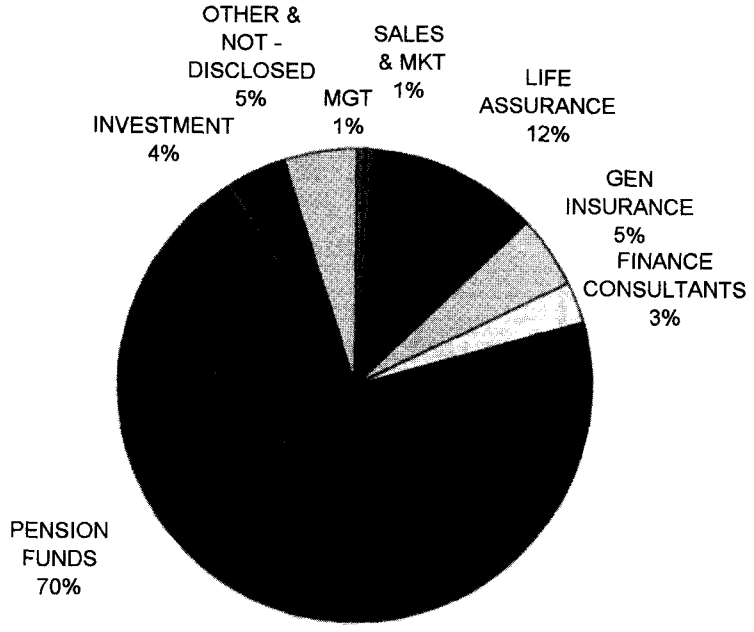

Figure 5. U.K. Fellows (Institute only), work in consultancies, 1994

Figure 5 shows that consultant employment is dominated by pensions work (70%) compared with life assurance work (12%).

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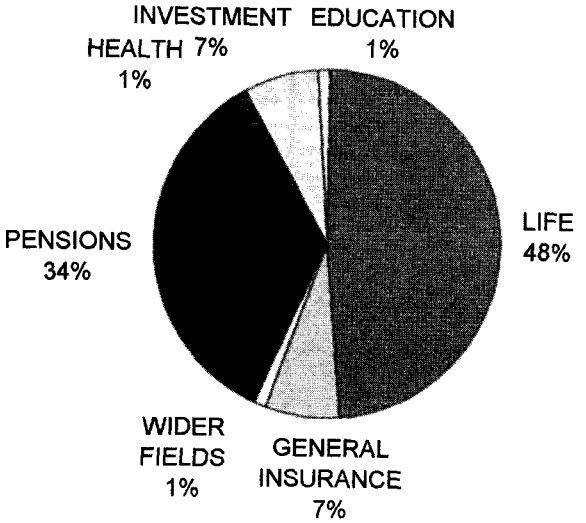

Figure 6. U.K. Fellows (Institute & Faculty), areas of work, 1994

Figure 6 is based on reallocating categories such as 'management' to work product areas. Whilst the results must be treated with some care, it is clear that life and pensions dominate employment, and that when general insurance and investment are added nearly all actuaries have been covered.

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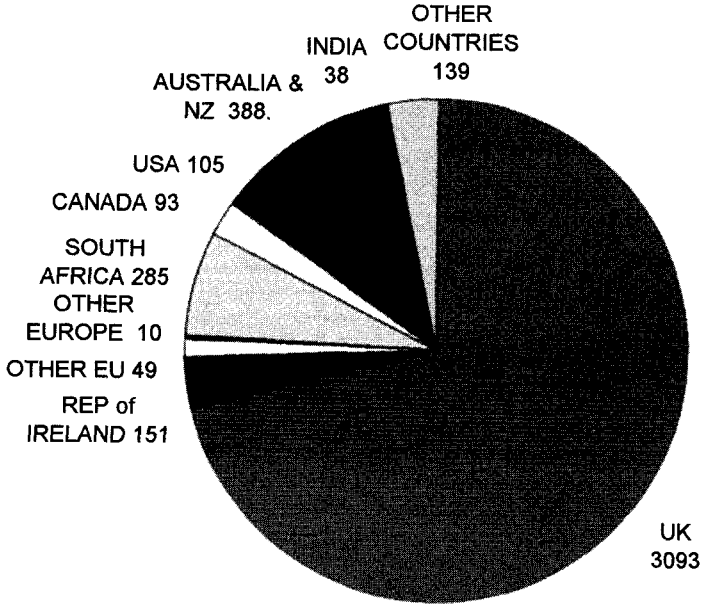

Figure 7. Numbers of Fellows (Institute & Faculty), employment by country, employed members, 1995

Figure 7 shows the distribution of qualified actuaries by geographical location. Just over 70% of U.K. Fellows live in the U.K. A further 25% live in countries which had established links with the U.K. (or more particularly the U.K. profession), mainly Australia, New Zealand, India, Canada, South Africa and Ireland. Penetration of markets outside these traditional areas is quite limited. However, it is worth noting that a total of 164 U.K. Fellows live (and presumably work) in the U.S.A. and continental Europe. Of the 139 shown as living in 'other countries', around half are in Asia. It will be worthwhile to track the extent to which this figure changes in the future.

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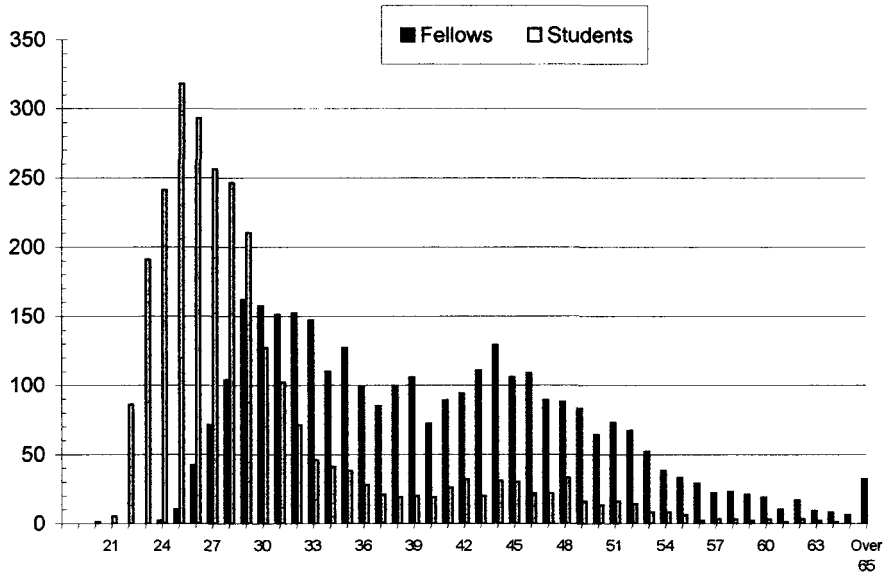

Figure 8. Numbers of U.K. members (Institute & Faculty), distribution by age, employed members only, 1995

Figure 8 shows the distribution of U.K. members by age. This illustrates the effect of fluctuating recruitment levels evident in Figure 2. The effect in this age distribution of the 1975 and 1992 peaks is, however, much more pronounced. The peaks of students at around 25 years old and of Fellows at around 30 are a reflection of the 1992 peaks, whilst the peaks of Fellows at 44 reflects the 1974 peak of student members. Probably the key issue from this graph is the significant increase in Fellows to be expected over the next few years, irrespective of new recruitment.

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21. *SELF-ANALYSIS*

The profession's present strategic plan sets out the Mission Statement with its five associated strategic aims. Within these, action is in hand to develop the strengths and counteract some of the weaknesses as seen today. The following sets out a range of strengths and weaknesses.

21.1 *Strengths*

(1) This is a small, tight, exclusive profession, with considerable pride and loyalty.
(2) Actuaries are recognised as highly qualified, technical individuals. Their standing in a technical environment is very high.
(3) The role of the profession is prescribed in legislation, and this legislation will probably be extended to new areas.
(4) Actuaries are still in considerable demand in pensions and parts of the life sector.
(5) At the highest levels in the international arena, the U.K. profession's voice is heard and respected.
(6) In the fast changing world of public expectations, actuaries are still seen as impartial or supportive of consumers' interests as well as commercial considerations.

21.2 *Concerns*

(1) The length of time taken to reach fellowship.
(2) The continued high failure rate of 'experienced' students taking the later papers.
(3) The low levels of involvement of actuaries in probabilistic techniques and realistic evaluation.
(4) An over-emphasis on obscure valuation methodology and legislative correctness.
(5) A lack of business awareness and communication ability.
(6) Insufficient emphasis on general business skills.
(7) The variable perception of the profession by others. (The team was impressed by the findings of the Faculty Market Research team in their reports in 1991 and 1993. The unsatisfactory perceptions by key players (careers advisers, university recruiters, etc.) and the lack of change in those perceptions over the years were worrying.)
(8) On achieving fellowship, most actuaries are perceived as fairly narrow specialists compared to those becoming accountants or obtaining an MBA. Fellowship is not seen as a starting point for a business career. The few actuaries who succeed outside the traditional areas rarely boast of the value of their actuarial training.
(9) The threat of soft encroachment from others in various forms, e.g. accountants, the Chartered Insurance Institute and others.
(10) The lack of diversification from traditional areas.

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(11) The present examination syllabus has, for too long, focused on the detail of U.K. legislation, and this has been one reason for its lack of appeal to other countries. The syllabus is exceptionally deep, and the absence of an intermediate level qualification has, perhaps, deterred overseas interest.

22. *THE PROFESSION AND OTHER PROFESSIONS*

The role of many professions is changing rapidly. Therefore, actuaries face competition from other professions and the challenge of working in mixed firms alongside colleagues with other professional training.

22.1 The profession can no longer claim a monopoly in areas where it traditionally practised. Potential actuaries can obtain qualifications, for example, with the Institute of Investment Management and Research, the Chartered Insurance Institute or the Pensions Management Institute.

22.2 The time taken to qualify as an actuary, compared with the clearer timetable and sharper focus of other professional bodies, may discourage people from starting the long haul of actuarial exams.

22.3 Actuaries have traditionally enjoyed high levels of remuneration. Management can often make economies by directing tasks towards non-actuaries, where they are suitably qualified and less expensive.

22.4 Within the insurance world, actuaries occupy fewer of the senior management positions than they did a generation ago. The concept of companies being run by actuaries has seen a steady decline.

22.5 Many of the major pension consultancies have formed alliances with, or been taken over by, employee benefit firms, whose senior management is often non-actuarial, and who can make economies by employing consultants and limiting actuaries to technical work.

22.6 Restrictions on forming multi-disciplinary practices have been disappearing, though the Law Society still prevents its members from forming partnerships with other professionals. The existence of actuaries working alongside those from other professions offers the opportunity for reallocation of responsibility. This includes the assumption of former actuarial duties by non-actuaries, and the encroachment of actuaries into new areas where they have not previously practised.

22.7 The steady growth in the number of actuaries over the past generation has somewhat reduced the mystique of being an actuary and increased understanding, awareness and acceptance of actuarial skills within the professional world at large.

22.8 Actuarial firms are much smaller than most other professional firms, and it is less likely that actuaries will be taking the lead in developing multi-disciplinary practices. Accountants have currently taken the lead, though a few actuarial firms do have partners who are not themselves actuaries.

22.9 Multi-disciplinary firms represent a new opportunity for customers to buy all their services under one roof. Some would prefer to buy services from

different firms, though a world that had only multi-disciplinary firms might make this rather difficult.

22.10 The profession needs to ensure that its members, individually, see themselves as actuaries bound by their own professional code. The profession should be concerned that those with whom actuaries form alliances should act in a similar way in relation to their own professional codes. Whatever the nature of the organisation, the professional responsibility of each member of a firm should be driven by the code of conduct of his or her own profession.

22.11 In considering how the actuarial profession has, and should, react to these changes, there is a distinction between 'desirable' change and change caused by the profession (or individuals) failing to adapt. Therefore, improved technology leading to 'de-skilling' is desirable, whereas the displacement of actuaries through inappropriate training is not.

23. *Conclusions To 'The Profession Today'*

From the foregoing sections on 'The Profession Today', the team deduced the following as being particularly relevant:

(1) The adjacent areas growth model would seem to be the most appropriate one. Predictions should, therefore, be tested against it.

(2) After making adjustments to allow for actuaries working in management in both the life and pensions sectors, it is clear that these areas provide employment for about 80% of the profession in the U.K. This is a significant proportion, and, therefore, justifies a detailed study of these two sectors in the future.

(3) Changes in education and training are being proposed, but they will take some 6 to 8 years before being reflected in the heart of the profession.

(4) The bulk of the actuaries who will be in senior management positions in 2005 to 2010 are already qualified. Hence, considerable training efforts within the profession will be needed to manage any significant changes of emphasis in this time frame. This will require a high level of self-motivation.

(5) Having 40% of the profession in consultancy should mean that changes in demand for particular actuarial services are quickly recognised. Consulting firms are then likely to react fairly quickly to redeploy resources, or to adjust employment levels.

(6) In view of the work being done on the present examination syllabus, the team saw little value in conducting an additional detailed review of the examinations. Instead it concentrated on general topics and changes in emphasis, and hoped that its conclusions will give further weight to the present discussion.

(7) There is increasing pressure from other professions to challenge the right of actuaries to be the sole operators in certain areas. The profession is uncertain how to react to this and to the possible opportunities of working in multi-disciplinary partnership with those same professionals. The profession should be more focused on the best way to interact with other professions.

(8) The age distribution of the profession (Figure 8) shows that the higher recruit-

ing in the late 1980s has led to a considerable bulge in the 29-32 age group.

(9) There is a very significant time lag in producing a qualified actuary, especially if the decision to become an actuary is taken early in a degree course or before.

(10) A small proportion of the U.K. profession work in the U.S.A., continental Europe and Asia. Growth in these areas would present a significant opportunity.

POSITION IN 2005

24. This section of the report sets out some general reflections on the expected environment in 2005 as it might affect the work of actuaries. The team studied many diverse forecasts and reports, and saw little value in rehearsing them or commenting on them in detail in this report. However, there were some events which, if they occurred, would have a significant impact on the profession.

25. *GENERAL POINTS FOR FUTURE SCENARIOS*

25.1 *Demography*

Within the European Union the problems caused by an ageing population have already been forecast, if not solved. Although there will be a consequent shift towards the areas of pension and health products, savings markets are already highly developed and population growth is slow. This contrasts with the growing population and increasing savings markets which will develop elsewhere.

25.2 *International Trade*

25.2.1 Trade in financial services within the E.U. is, in theory, unrestricted, but seems unlikely to develop in a totally free cross-border manner. The present trend towards company takeovers between countries should continue, as the public will continue to prefer to deal with apparently 'national' firms and products.

25.2.2 The World Trade Organisation is working hard to allow cross-border trade in financial services. However, it is unlikely to achieve a world-wide breakthrough that could have a serious effect by 2005. Even after that date governments would still prefer to develop their own companies, albeit owned and controlled from overseas, but with local staff handling the work.

25.3 *Financial Products*

The future market for products and advice will be linked to three factors: customers and markets; products and distribution; and technology.

25.3.1 *Customers and markets*

— Consumerism will continue to increase.
— As a trend, governments will withdraw from supporting individuals.
— The amount of regulation will stay the same or increase.
— Most customers will be more aware and will seek simple products. A minority will continue to need particular advice and special solutions.

25.3.2 *Products and distribution*

— Simple products will be distributed at minimum cost.
— Complex products will probably only be offered by larger companies or those working in a specialist market.
— Such complex products will require a proactive distribution process that will, therefore, exist to cover this need.
— Competitive pressure will increase in all sectors, bringing more strategic alliances and mergers.

25.3.3 *Technology and business skills*

— There will be an unbundling of certain products and advice, so that individuals (the public or advisers) can manage sections of the previous whole.
— Products will be designed with the appropriate technological support in mind.
— Combined with simpler products, this may give the impression that some actuarial advice and support is not needed.
— Only those companies that use modern financial tools and techniques will survive in Europe.
— Greatly improved information exchange, networks and easier payment methods will simplify both marketing and purchase.

25.4 *Possible Dramatic Shifts*

The team reviewed their overall forecasts and those of others, to see if there were any likely scenarios that would have a dramatic effect on the U.K. or international scenario in this study. Four events were considered. They are mentioned here and discussed at greater length in the sector forecasts:

(1) new compulsory pension scheme;
(2) major government-led development of pensions/long-term care requirements;
(3) an extensive new regulatory system (noting that over-regulation can produce a reaction that pushes the pendulum the other way); and
(4) tax changes, e.g. gross roll-up for life products.

Extreme scenarios, such as a major collapse of a financial sector, have not been considered.

26. *LIFE ASSURANCE*

26.1 *Approach*

In the case of life assurance, the future work and demand for actuaries are closely bound up in the overall health of the companies themselves. The life sector provides employment for about 47% of U.K. Fellows, so the team has devoted proportionally more effort to life offices. It has not proved possible to separate totally the work on pensions within life companies from that in the pensions forecast. However, the team was aware of possible double counting, and has taken it into account.

26.2 *Current Position and Recent Trends*

26.2.1 During the last decade there have been many changes in the life industry. These have included a considerable expansion of business written by life offices during the 1980s, a significant reduction in the financial strength of many companies, and increased competition lately from new entrants as diverse as Marks & Spencer, Virgin and Direct Line.

26.2.2 The following issues will change the way companies operate, and are currently being addressed by the life industry:

— poor public image;
— some inappropriate sales methods and recommendations;
— the need for higher training standards for sales people and a commitment to increased professionalism;
— increased regulation;
— a public unwilling to commit themselves to long-term savings;
— products seen as expensive by the public;
— ongoing government support for private pension provision in place of state provision;
— opportunities to respond to the need for healthcare products (permanent health insurance (PHI), private medical insurance (PMI), long-term care (LTC) and critical illness insurance);
— falling new business levels for many companies; and
— expense over-runs.

26.2.3 The last few years have seen various efforts to tackle the challenges faced. Visible signs of change have been:

— re-engineering of processes within companies;
— changes in distribution strategy; and
— restructuring, including closures to new business, sales and mergers.

26.2.4 The team believe that the long forecast process of change for the life industry has started. It is expected that significant change lies ahead, and that, by the year 2005, the life industry will look very different from now. An extrapolation of the last ten years is unlikely to lead to the probable position in 2005.

26.3 *Issues which will Impact the Life Industry up to 2005*

26.3.1 The key issues which are expected to play a part in determining the way the life industry looks in 2005 are:

— the impact of new entrants on existing players;
— the impact of new technology;
— the ability of offices to manage financial strength;
— the ability of offices to control and reduce expenses (fixed, variable and commission);
— the ability of offices to develop relationships with customer groups;

— the ability of the industry to respond to increased competition;
— the ability of offices to offer products which meet the changing needs of customers (e.g. more flexible, simpler and shorter term); and
— the ability of offices to meet increased demand from individuals due to a reduction in state support.

26.3.2 Other issues which will play a part are:

(1) the impact of:
  — disclosure on business levels;
  — increased competition on business levels;
  — changes in distribution;
  — developments in Europe;
  — impact of changes in taxation; and
  — financial conglomerates; and

(2) the ability of:
  — offices to achieve good investment performance; and
  — offices to meet the demands of an ageing population with appropriate healthcare products; and

(3) the attitude of shareholders to their U.K. life industry investments.

26.4 *Forecast Trends to 2005*

26.4.1 There will be significant pressure on expenses which will result in a considerable number of cost-cutting exercises in the industry.

26.4.2 Disclosure is resulting in business volumes in the short term being depressed. The longer-term outlook is a move towards more competitively priced products and a growth in volumes.

26.4.3 Products are likely to be shorter in term, simpler, more flexible and have lower margins. Tax disadvantages may be removed, and there may be a swing in the investment product mix to tax advantage products such as PEPs. On the other hand, there will also be an increase in the size of the longer-term pensions market due to the continued swing from state provision to market provision.

26.4.4 Offices with an identifiable customer base are more likely to survive.

26.4.5 The approach to distribution adopted by offices will be critical to their ability to survive. The following comments are a distillation of the views of the team:

— Independent financial advisors (IFAs) will remain a significant distribution channel. Whilst the number of individuals employed by IFAs may remain fairly unchanged, the number of IFAs is almost certain to decline.
— Prospecting direct sales forces (DSFs), tied agents and home service agents/salesmen will be under pressure to adapt or decline.
— The bancassurers, direct distributors and new entrants are expected to make gains in market share at the expense of the first two groups.

— For the purposes of estimating the likely demand for actuaries, the key issue is the extent to which bancassurers, direct distributors and new entrants gain market share over the 'traditional' distributors. For the purposes of this report, a working assumption of the 'new' distributors having a 30% market share seemed reasonable. Compared with mid-1995 market share, this gives the following comparison:

	1995	2005
IFAs	51%	
DSFs	32%	70%
Tied agents	4%	
Bancassurers	11%	
Direct marketing/Telesales	2%	30%

26.4.6 The team believes that the demand for life assurance, pensions and savings products will remain, and, in some cases, increase. Offices that can distribute efficient, competitive and flexible products, which meet customer needs and also produce good investment performance, will survive. For those offices positioned correctly the future will be attractive.

26.4.7 It is anticipated that many companies will not be able to address successfully the current and ongoing challenges, and that there will be a significant level of restructuring within the industry. Many commentators have forecast that 30 to 40 of the existing companies will have disappeared by the year 2005. From a starting position of 90 prominent companies that were considered, there may be 60 remaining in some form by 2005. There may be further new entrants, in particular in the area of direct writing. It could be reasonable to assume 10 new entrants by the year 2005.

26.4.8 The total new business (annual premiums + single premiums/10) in 1994 was approximately £4 billion. By the year 2005 the total new business (allowing for inflation) may be in the range £6 billion to £10 billion.

26.5 *Confidence Levels and Possible Shocks*

26.5.1 We are confident that the number of prominent life companies in 2005 will be less than there are at present. Our central estimate is 70 companies, but the actual number could lie in the range 50 to 90.

26.5.2 It is difficult to be very confident about the forecast of market share by distribution channel. The team feel, however, that IFAs will remain credible and their market share may even increase slightly. The difficulties of running a DSF will continue. In addition, the bancassurers are finding that running life offices is not as easy and as profitable as many had first expected. We feel only moderate growth is realistic. The key point about our assumption, from the point of view of forecasting the future requirement for actuaries, is the move in the split of business written by traditional and 'new-type' offices from 87:13 to 70:30.

26.5.3 We have projected quite a wide range for the size of the market. The

lower end of the range assumes growth in line with a rate of inflation of 4%, and it is difficult to conceive circumstances other than, say, an armed conflict which would produce a lower outcome. The upper estimate assumes compound growth (including inflation) of 10% p.a., and this could prove to be an under-estimate if, for instance, we return to a high inflationary environment or if compulsory pension provision was introduced.

26.5.4 If compulsory private pension provision was introduced, then it is expected that competition would be based on price rather than product differentiation, and this would favour bancassurer providers. There could also be a move towards industry schemes. It is felt that this would reduce the requirements for actuarial expertise in life offices, particularly among the traditional players.

26.5.5 Major legislative or regulatory change could have a dramatic effect. Some changes could lead to increased requirements for actuaries e.g. increasing the responsibilities of Appointed Actuaries. Other changes, however, might allow accountants and others to encroach further.

26.5.6 It is considered unlikely, but possible, that there could be changes imposed by the E.U. which would have a significant effect on the current approach to product development in the U.K., e.g. standard pricing bases.

26.6 *Factors and Assumptions determining the Number of Actuaries*

26.6.1 The points set out below are expected to have a positive impact on the demand for actuaries:

(1) The size of the market in the year 2005 — there is considerable uncertainty about this, but the impact of the move from state pension provision to private pension provision is likely to see a growth in overall market size.
(2) An increase in cross-border business within the E.U. seems likely, and it is generally felt that U.K. offices are well placed to benefit overall from this activity.
(3) There is likely to be increasing use of derivatives, both in terms of individual product design and as financial instruments in asset/liability considerations. Derivative work is well suited to actuarial expertise, although few actuaries have made their name in it.

26.6.2 The following points are expected to have a negative effect on the demand for actuaries:

(1) The anticipated reduction in the number of life companies by the year 2005 is likely to mean fewer opportunities for actuarial employment.
(2) The expected change in the distribution by type of company by 2005 and the requirement of the different types of companies for actuaries will influence demand. It is likely that the new entrants will, similarly to bancassurers, decide on a lower level of actuarial involvement than the traditional companies.
(3) Encroachment from accountants in areas traditionally the sole preserve of actuaries is likely to increase; but this could well be by way of multi-disciplinary

practices, including actuaries, and, therefore, the net effect could be neutral or positive.

26.6.3 A fall or rise in the popularity of with-profits business will impact on the demand for actuaries. The position in recent years has been a little erratic, and the outlook for with-profits business is uncertain.

26.6.4 As the amalgamation of life companies progresses, demand for actuaries in consultancies will increase. Thereafter it will fall back.

26.7 *Actuarial Skills Required in the Life Sector*

26.7.1 Whilst the analysis of the size, shape and health of life offices is an essential backdrop to the assessment of the future of the profession in this sector, it does not, in itself, provide detailed guidance on the work of actuaries in the future. The changing demand on actuaries will be derived from:

— increased effort on understanding and reporting on profit (and its reporting to non-actuarial managers);
— greater involvement in expense analysis and control;
— involvement in strategic development pushing forward opportunities world-wide;
— increased emphasis on customer focus and the necessary technical support;
— a reduction in pensions technical work, as insured final salary schemes decrease in number;
— a reduction in the number of actuaries running administrative departments and in systems development; and
— an increasing tendency for management to form or hire project teams to produce a quick solution to particular problems; special skills will be needed if actuaries are to lead such work (e.g. a flexible approach to problem solving).

26.7.2 Reflecting the changing requirements for actuaries, the following table gives some feel for the changing balance of employment in a typical 'traditional' office. The total number shown is 25 in both 1995 and 2005. In fact, in 1995 the average was 18. In effect, some individuals are fulfilling several of these roles, especially in small offices. An alternative scenario for 2005 could be produced with much lower actuarial requirements, with others carrying out the 'new' functions.

	1995	2005
General management	4	3
Appointed Actuary	1	1
Valuation	2	2
Financial modelling	2	4
Expense analysis	0	1
Product development	2	2
Strategic development	1	2
International development	1	2
Sales support	1	2
Pensions technical	3	1
Administration (others cheaper)	3	0
Investment	2	2
Systems	2	0
Projects (if trained)	1	3
Total	25	25

26.7.3 *List of Skills*

From the discussion on the work and forecast size and shape of the future life industry — both traditional and 'new-type' offices — the skills required in the future will include the following:

(1) stochastic modelling to support work in:
   — asset/liability problems;
   — derivatives;
   — risk management (analysis and policy);
   — dynamic solvency testing; and
   — reserving;

(2) a shift from life models to living benefit models (e.g. LTC);
(3) technical pensions expertise, especially personal pensions;
(4) a knowledge of personal taxation to assist in personal financial planning — this could also be led by the increasing requirement for self taxation calculations;
(5) traditional skills:
   — product design and packaging;
   — solvency;
   — management/communication skills;
   — valuation; and
   — regulation compliance;

(6) project tasks, skills — mergers, changes in legislation, changes in sales force — all requiring project planning skills and communication skills;
(7) understanding of the distribution process, underwriting and the workings of unit and investment trusts;
(8) understanding financial economics; and
(9) understanding accounting issues especially with the development of 'realistic'

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

reporting throughout the world (e.g. U.S. GAAP, achieved profits, margin on services).

26.8 *Estimate of Number of Actuaries in the Life Sector in 2005*

26.8.1 The team compiled some background statistics to help estimate the number of actuaries and offices in the future:

— Annex C lists the prominent offices. It gives the number of actuaries, the number of employees and the premium income, where available. The relationship between the number of actuaries and the number of employees and between the number of actuaries and premium income is also shown.
— Annex D gives the same information, where available, for 1985.

26.8.2 The key points which we noted from the analysis were:

(1) The number of actuaries currently working for life assurance offices and with reassurers is about 1,540 (1,400 life offices and about 140 as consultants). In 1985 this number was about 1,000 (allowing for actuaries employed by companies which are no longer in existence).
(2) The average number of actuaries employed by bancassurers is less than the average number employed by traditional companies. The average numbers for 1995 were 18 for traditional offices against 7 for bancassurers.
(3) Over the last ten years the ratio of actuaries to total employees has increased by a quarter. The ratio of actuaries to total premium income has halved.

26.8.3 The increase in actuarial employment over the last ten years has been much less than the strong growth of assets-under-management. The increase in the ratio of number of actuaries to total employees is felt to be due to an increasing degree of efficiency within the industry through the use of technology and the resultant decrease in the proportion of clerical jobs.

26.8.4 We believe that the relatively benign trends over the last ten years cannot be projected over the next ten years. The scope for actuarial employment in 2005 will depend on the size of the market, the number of companies and the type of companies at that time. Given our predictions above, for these factors, we would estimate that the range for the number of actuaries working in the life industry in 2005 will be 1,200 to 1,800.

26.8.5 The minimum demand of 1,200 assumes a fairly stagnant overall market size, but within this there will be a shift from life products to pension products, and, therefore, a shift of actuarial involvement towards the pensions areas within life offices. A reduction in the number of life companies to 60 would still leave a strong degree of competition through product differentiation. This trend will retain a definite need for actuarial involvement.

26.8.6 The maximum demand of 1,800 reflects an extremely strong market growth factor, together with a shift in emphasis from traditional group pension schemes to group personal pension or individual pension plans. Connected to this will be a reversal in the trend for actuaries to move from life offices to

consultancies. Under this scenario, we have also assumed a very strong emphasis on competition through product differentiation, a much increased use of derivatives and greater use by offices of modelling techniques. All these areas require significant actuarial involvement.

26.8.7 Whilst the team settled for an expected demand of 1,500, we believe that it is worth commenting on one shock factor which has a higher probability than others, and that is the possibility of meaningful compulsory pension provision being introduced. The team believe that this would contribute to a 'disaster scenario' for actuarial employment:

— There would be a massive switch in emphasis from competition on product differentiation to competition on price. This, in turn, would produce a shift in pension provision from the IFA and direct sales distribution channels toward bancassurers, telephone selling and direct marketing. The bancassurers, with their large customer bases and household names, would be likely to dominate the market.

— Annex C confirms that bancassurers have a much lower reliance on actuarial input. We feel that, if there was such a dramatic shift in market conditions, the disaster scenario for the number of actuaries employed would be 600 by the year 2005.

26.8.8 Within these figures there will be a small shift to life consultancy. The current 140 may grow to 250 or more, depending, in part, on the migration of consultants to the Far East.

26.9 *Main Conclusions from the Life Sector*

26.9.1 Actuarial work and employment is directly related to the strength and structure of the life companies. They presently employ about 47% of the U.K. profession. This study's conclusions are thus linked to assumptions on the future of these companies, and should, therefore, be reassessed from time to time.

26.9.2 The most critical assumption is that of the market share of distribution channels, and hence the split of new business written by traditional and 'new type' offices. The forecast is for this split to change from 87:13 to 70:30. Of some 90 prominent companies in 1994, about 60 will remain in 2005 with 10 'new type' entrants.

26.9.3 New entrants will employ fewer actuaries, and traditional offices will shed those actuaries who may have been moved to more administrative appointments, but are still retained at actuarial rates of pay.

26.9.4 Actuaries will need to prove their worth to hold some jobs where other professionals will intrude. Project work, for example, will not fall into actuaries' arms unless they can demonstrate that they can do it better than others, irrespective of whether, within the profession, actuaries believe that they can clearly add greater value.

26.9.5 In addition to the present traditional skills of product design, solvency, valuation and regulations compliance, the following would be needed:

— stochastic modelling to support several other areas of work — asset/liabilities, dynamic solvency testing, risk management;
— running living benefit models as opposed to life models;
— improved underwriting and distribution understanding and skills;
— project tasks;
— financial economics;
— company re-organisation knowledge;
— personal taxation; and
— improved knowledge of realistic accounting techniques.

26.9.6 Against a 1995 figure of about 1,500 Fellows, in 2005 there could be a maximum demand for 1,800 and a minimum demand of 1,200. The expected demand would be 1,500. If a new compulsory U.K. pension scheme was introduced, together with a fierce change to 'new type' offices, then it would be possible for demand to change to 600.

27. *PENSIONS*

27.1 As discussed in Section 20, some 34% of Fellows are employed in the pensions sector. However, this is split between those in consulting practice involved in pensions, and the balance in life companies. This has complicated the calculations for the future, but allowance has been made for this overlap with the life sector and the common shocks/trends have been pulled together in Section 35.

27.2 *Current Position and Trends*

27.2.1 There has been an enormous expansion in the number of consulting actuaries — from about 350 to 1,150 — in the past 10 years. The increase in the number of advisers on pension funds appears to be unrelated to the number of pension schemes or pension scheme members. Figure 9 shows that the best correlation is probably with the value of private sector scheme assets.

27.2.2 The cost of advice to a pension scheme can be quite substantial, but is more than offset by the taxation benefits of having funds invested free of tax. A reasonable indicator of the willingness of industry and commerce to continue to pay for professional advice is, therefore, the size of pension scheme assets and, by implication, the value of the tax relief which is gained by running a pension scheme. Over the period since 1983 there has been a steady increase in the size of pension scheme assets, in part because of good investment returns, but also because of the growing liabilities of schemes themselves. Although they are now maturing, the ultimate size of pension scheme assets is likely to be around twice their current level in 25 years' time, if current policies continue. Considering this, the pension funds may be prepared to take significantly more actuarial advice, including developing areas such as asset/liability modelling, derivatives advice and new forms of benefit design, whilst still justifying the expense of the advice by the benefits to be obtained through the tax relief of pension funds.

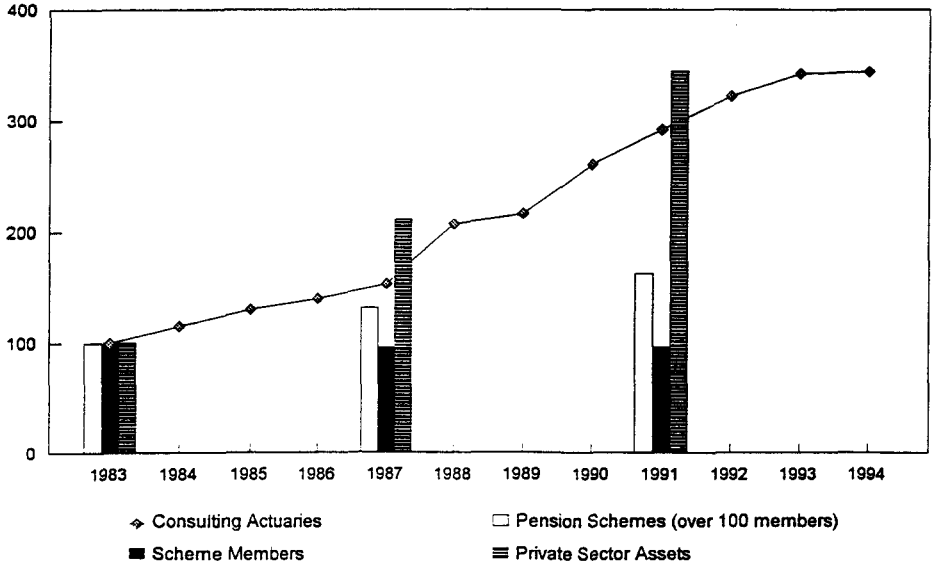

Figure 9. Growth in numbers of consulting actuaries (1983=100)

27.2.3 There is a steady increase in the responsibilities of actuaries for pension funds. There are some seven Guidance Notes, with more to come, and the Pensions Act 1995 will require formal Scheme Actuaries.

27.2.4 There has been a significant increase in the number of people describing themselves as pension consultants. With experience and with or without formal qualification, these consultants, supported by well-written software, can perform some of the work which is now being carried out by actuaries. This trend has had the effect of forcing organisations to use their actuaries in the most efficient manner and, hence, in the most technical areas. The efforts of non-actuarial consultants have been reflected in the growth of the Pensions Management Institute (PMI), which was established to train those concerned with the management and administration of pension schemes and the technical tasks that they have to carry out. There is some overlap with actuarial training and, indeed, qualified actuaries are exempted from some of the PMI exams. The appearance of the APMI qualification may represent a threat to the actuarial profession in providing an alternative qualification for carrying out tasks which have, until now, been the province of actuaries.

27.3 *Trends to 2005 and Beyond*

27.3.1 The Pensions Act 1995, with its minimum funding requirements,

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

together with any special regulatory functions, will call for an increase in work for actuaries.

27.3.2 *State provision*

The state provision for personal pensions is reducing, and will probably continue to reduce, whichever political party is in government. This trend is applicable, even with a possible new compulsory pension scheme, for those not in an occupational scheme.

27.3.3 *Money purchase*

Whilst one or two companies have indicated that they intend to change, a large scale switch to money purchase schemes, for schemes of a reasonable size (say 100 members), has yet to materialise. Money purchase/final salary hybrid type arrangements may well become increasingly popular. The contracting-out review will, no doubt, provide a review of COMPS and whether these should be wound up and/or switched to group personal pensions. Whilst money purchase schemes have less need for actuarial advice, there could be a lot of one-off work in restructuring existing final salary schemes. Also, it is likely that money purchase schemes may well have more sophisticated investment options than currently exist, and companies will be more interested in the level of benefits provided by the schemes, including 'risk benefits' such as ill-health pensions and death benefits. More people will be retiring with money purchase schemes, and, generally, the income provided by them will be low compared with final salary occupational schemes. This will be due to companies switching to money purchase schemes as a less expensive (i.e. company contribution rate is lower) means of providing pension provision for employees. Such schemes are attractive due to their defined contribution or cost to the company. A lower overall level of company contribution to schemes will result in lower levels of benefits. Money purchase schemes afford less flexibility to companies in using the pension scheme to aid major changes in staff numbers (e.g. by granting generous early retirement terms to those being made redundant). It is possible that such factors will eventually cause a swing back to final salary or some other form of defined benefit scheme. It can be argued that an increase in money purchase schemes will benefit the profession, in that advice will be sought on the ultimate purchase decision.

27.3.4 *Final salary schemes*

Final salary schemes which are fully insured, i.e. the insurance company administers them, invests the assets and is actuary to the scheme, tend to be smaller schemes. Thus, it is likely that a greater proportion of insured, as opposed to self-administered, schemes will switch to money purchase, reducing the number of pensions actuaries required by insurance companies. Existing final salary schemes all have a considerable run-out period, because they are difficult to wind up.

27.3.5 *Pensions for part-timers/temporary staff*

Sex equality legislation is making companies open up their pension schemes to part-time employees, thereby increasing the overall percentage of the working population who are covered by occupational pension schemes. Where companies have a significant proportion of their staff who are part-timers, money purchase schemes may well prove to be more attractive from an administrative, as well as from a cost, point of view. This is particularly true where the part-timers change their hours frequently. As there can be legislative problems with offering money purchase benefits, which are generally inferior to final salary benefits, to part-timers and final salary schemes to full-timers, this is another factor which will promote a shift towards money purchase schemes.

27.3.6 *Pensions for senior executives*

A lot of companies have either done nothing, set up an unfunded scheme or are paying salary supplements for senior executives. Over the next 10 years unfunded liabilities will increase and become more significant in company balance sheets, causing companies to review this method of provision. Also, the problems of the companies that have done nothing or have paid some form of salary supplement may well come to the surface. More interest may be shown in switching to funded unapproved schemes. It is possible that an increasing number of large companies will move towards having all possible compensation vehicles i.e. funded unapproved, unfunded unapproved and salary supplements. There is still plenty of scope for advising companies in this area.

27.3.7 *The Greenbury Report*

The Greenbury Committee Report recommended a greatly expanded disclosure about pensions provided for directors. Actuarial calculations will be necessary, and increased awareness of the cost of pensions for directors and senior executives may lead to increased demand from remuneration committees for actuarial advice, as they consider the appropriate pension provision to make for their executive directors.

27.3.8 *Other points*

Whilst there are probably many other minor adjustments that could occur, the team believed that the above constituted the principal changes. Other points considered were:

— *SSAP24*. More companies are now using different SSAP24 assumptions from their standard valuation funding assumptions, creating a need for more detailed advice in this area. There may well be a move to more prescriptive SSAP24 bases.

— *New government*. In addition to any changes brought about by a compulsory pension scheme, a new government could freeze the earnings cap or change the tax relief system. Such changes will, as always, produce a short-term requirement for additional actuarial advice.

— *Litigation.* The past few years have seen an increasing number of pension litigation cases, giving rise to a demand for actuaries to give evidence as expert witnesses. This trend is likely to continue.
— *Customer focus.* Actuaries working in pensions are increasingly facing the problems of having to represent the interests of various parties (employer, trustee, pensioner, scheme member, etc.). These complications will continue. The team noted this development, but was content to raise it as a point of interest. It could, however, increase demand for actuaries, and also have implications for training and professional guidance.

27.4 *Possible Shocks*

Shock events would be:
— the removal of the favourable tax treatment for occupational schemes;
— a sudden larger scale switch from final salary schemes to money purchase schemes, with current members switching as well;
— the introduction of a compulsory pension scheme, on a money purchase basis, and companies starting to close their own schemes and participating in the compulsory one;
— a stock market collapse or similar event that would cause many schemes to become insolvent and wind up; or
— the introduction of new savings vehicles that were more attractive relative to pension schemes.

27.5 *Actuarial Skills Required in the Pensions Sector*

27.5.1 Many of the traditional actuarial skills will continue to be needed in the pensions sector, but two areas, in particular, will demand greater expertise:
— the work of the Scheme Actuary in reporting on funding and contributions; and
— corporate pensions advice on pension scheme design and other employee benefits.

Both have similar patterns of technical need and especially high levels of skill in reporting and in funding.

27.5.2 *Reporting*

This embraces not just formal work in accordance with legislation, but also clear communication of ideas and proposals to many audiences. Confidence is built on the easy transmission of concepts and ideas. Whilst the profession may have the best understanding of these ideas, if they cannot develop and present them actuaries will find that they will surrender the lead to others who may be less qualified in detail, but better able to manage and communicate.

27.5.3 *Funding*

Expertise in funding is developed through training and the examination

process. Changes in legislation and practice will need to be carefully learned and relearned. Additional sophisticated developments in funding will require:
— stochastic models; and
— asset liability studies.

Further tools and techniques need to be fostered and led by the profession to demonstrate to others that further information can be provided to those sponsoring and belonging to pension schemes.

27.5.4 *Innovation*

The increasing requirement to pull together both the concept and detail of various pension products with those of long-term care illustrate the trend for the future. Actuaries may talk at length in generalities, but they must also produce the innovative ideas to solve problems.

27.6 *Factors and Assumptions Determining the Number of Actuaries in 2005*

From the trends, confidence levels and possible shocks, the deductions leading to the forecast requirement for 2005 and beyond are explained below.

27.6.1 Virtually all the projections lead to an increase in work over the 3-5 year period. In some cases (minimum funding certificates and requisite benefits certificates) this increase will be sustained. In others the transition period on new legislation will end with, perhaps, a reduction in the number of final salary schemes.

27.6.2 However, it would be wrong to conclude that switching from final salary to money purchase schemes will result in a significant reduction in demand for pensions actuaries. Switching final salary schemes to money purchase schemes is a complex process, and many companies interested in making the switch may well do it for future new entrants, thereby retaining the need for a final salary pension scheme actuary. The resulting decrease in membership of a final salary scheme due to the lack of new entrants will not result in a directly proportional decrease in the amount of work required from the scheme's actuary. Also, there may well be a trend towards companies offering money purchase provision for younger employees and final salary provision for older employees, which may keep the levels of demand for final salary scheme actuaries the same as current levels.

27.6.3 Several separate factors will probably lead to additional work for the profession:
— increased demand for independent trustees — actuaries have a lot to offer as such trustees;
— there will be more opportunity to advise companies and trustees separately;
— innovative ideas — cost balance plans, career average salary schemes — will be produced; and
— there should be growth in investment advice work.

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

27.6.4 In contrast to the areas of greater opportunity, there are factors that will remove work from the profession:

— More sophisticated computer techniques will reduce the need for work traditionally carried out by actuarial students.
— The general unbundling of the total pensions package into single products that will not require adaptation will occur.
— This unbundling will allow other advisers (CII, accountants, IFAs) to extend their legitimacy and status. The vast majority of the public will find it reasonable to look for advice from a single source, and will not expect to seek out special individuals for part of this advice. A small minority will be prepared to do this if they have complex problems. This difficulty is picked up later under personal financial planning considerations. Those actuaries who remain in the pensions area and seek to deal with the public will need to be complete experts in all aspects of pension provision.
— Public confidence in pensions schemes is currently fairly low. An improvement should occur, but if there is a collapse of a scheme after the new minimum funding requirements, then the profession's standing will be challenged — rightly or wrongly.

27.7 *Estimate of Number of Actuaries in Pensions in 2005*

27.7.1 The team considered that the minimum demand for the profession would result from a combination of the termination of final salary schemes (closing over the next 5-10 years) and the introduction of a new standard compulsory pension scheme. This would suggest a minimum demand of 900. It is about 1,100 today.

27.7.2 The maximum demand case would come from an increased call for minimum funding requirement work, together with additional advice on investments, both to company and new types of individual schemes. This would suggest a maximum demand of 1,700.

27.7.3 The most likely or expected outcome was a continued short-term increase due to the extra work from certification and a firm requirement for a mix of sophisticated and simple pension products. However, in the longer term this would tail off, with a requirement for about 1,200.

27.8 *Main Conclusions from the Pensions Sector*

27.8.1 The enormous growth in numbers of actuaries in consultancies has been driven by the demand for actuaries in the pensions sector. The demand is proportional to the value of private sector scheme assets, and thus future demand should relate to the ongoing value of these assets.

27.8.2 Whilst there may soon be a switch to money purchase schemes, there will be a long (3-8 years) run-out period for final salary schemes. Any change of legislation or compulsory scheme, followed by some form of switching, will generate work, albeit of a short-term nature, for actuaries.

27.8.3 The introduction of the Pensions Act 1995 with compulsory

certification will call for greater expertise from actuaries, but not necessarily a great demand after the initial small surge.

27.8.4 The traditional pension skills will be required in future, particularly in funding and contributions. Corporate pensions advice and the design of employee benefits will continue to be needed.

27.8.5 New or enhanced skills will be required; in particular:

— reporting and communicating ideas and proposals in this continually changing area; others will take the lead in this if the profession does not;
— funding expertise using more sophisticated developments in stochastic modelling and asset liability work; and
— to support innovative ideas to mix and match pension and long-term care products.

27.8.6 The present employment level of about 1,100 actuaries will increase steadily in the next 3-5 years, due to changes brought about by the Pensions Act 1995. However, with a move from final salary schemes and associated changes, demand in 2005 could fall to 900. The maximum demand of some 1,700 could occur if there was a clear political message to encourage an enhanced range of pensions products with a matching encouragement for long-term care provisions. The expected demand of about 1,200 reflects a continuing increase from 1995, but with a tail off thereafter.

28. *GENERAL INSURANCE*

28.1 For the purposes of this report, the general insurance sector does not include insurance to cover long-term care, which is covered in the health and care sector. Income replacement products in the event of poor health or the more straightforward medical insurance are not within general insurance, but are reflected in the life sector. In contrast to life and pensions, the team found analysis of the future less easy, despite lengthy discussions with those (both actuaries and others) involved. The possibility of overlap with life companies/composites was recognised, and figures adjusted accordingly.

28.2 *Current Position and Trends*

28.2.1 The strength of the general insurance sector, as measured by the volume of new business, is directly linked to the national economy and other European economies. Premium income varies due to increased competition. Overall the sector is in a period of growth, whilst experimenting with new selling and marketing techniques.

28.2.2 Cross border, within the E.U., business is developing in a manner similar to life offices, where local companies are purchased rather than new offices established. The growth of captive companies to retain reserves within a company or group may appear to remove business from the sector, but the actuarial and technical supporting work has still to be done.

28.2.3 At present there is an increasing demand for actuaries in the London Market and reinsurance.

28.3 *Forecasts of Trends up to 2005*

28.3.1 The demand for a more detailed understanding of product profitability leading to increased demand for actuaries in pricing is likely to continue.

28.3.2 The present increased actuarial penetration in reserving and financial modelling should continue. Over the next 10-15 years improved techniques — risk-based capital/dynamic financial analysis — will become accepted. If these techniques are proposed by the profession, there will be a clear growth in the demand for actuaries.

28.3.3 Employers will shortly realise that the present system of recruiting actuaries with 2 or 3 years experience is unsatisfactory. They will probably accept that the general insurance sector requires specific experience that would justify taking in actuarial students and new qualifiers. As the whole sector grows, the risk of individual companies losing on their initial investment in actuaries will cease to deter this approach.

28.4 *Confidence Levels and Shock*

28.5 The team believed strongly that the likely trends were very encouraging. Competitive pressures, combined with a steady acceptance of the value of actuarial tools, should lead to a considerable growth in the number of actuaries required.

28.5.1 If compulsory certification of reserves was required within the next year, the shock demand might not be able to be met with suitably experienced Fellows. This seems an unlikely scenario. However, it may only take the collapse of a major general insurance company to trigger such a situation.

28.5.2 The Equitas project has absorbed a relatively high number of actuaries over a short period of time. If the project is successful, many of these actuaries could stay in related work — particularly if they have proved their worth. On the other hand, as the project matures it could release 'surplus' actuaries who would probably be absorbed by the increased demand. This would delay the expected net increase in the forecast number of actuaries in the general insurance sector. Any further problems at Lloyd's could have negative implications for the demand for actuaries in this area of work.

28.6 *Actuarial Skills Required in General Insurance*

28.6.1 It was noted with interest that some senior general insurance actuaries recommended the syllabus and literature of the Casualty Actuarial Society to their juniors and students. On investigation, it appeared that the skills were not different to those taught in the U.K., but rather that they were covered in more detail and in a manner tailored to general insurance. This added weight to those who argue for a broad and thorough education, but followed by focused additional papers or CPD in a chosen area of expertise.

28.6.2 The work expected of actuaries in this sector will probably be a development of the present skills sets. There will be a requirement to improve on stochastic modelling techniques, together with a clear understanding of the interaction of assets and liabilities. As in many other areas, actuaries will need to enthuse on and prove the value of dynamic financial analysis.

28.6.3 General insurance will continue to require the use of traditional skills, but applied to small data sets with a wide range of outcomes. As there are greater levels of uncertainty and limited historical data, pattern recognition is important.

28.6.4 The team believed that formal certification alone would not be sufficient for the profession to establish its credibility in general insurance. It would need to prove the value of these skills in other ways, and we believe that the profession is being successful in this.

28.7 *Estimate of the Number of Actuaries in General Insurance in 2005 and Beyond*

28.7.1 The number of actuaries with general insurance expertise available in 1995 is about 200 Fellows and 300 students. Demand currently exceeds supply. Based on the earlier sections, the team concluded that the minimum demand would be for some 300 Fellows and about 500 students in about 2005. The maximum demand would be 500 Fellows plus 1,000 students. This assumes no change to the present throughput or to the existing examination syllabus.

28.7.2 The expected demand is 400 Fellows and 600 students. It must be said that there are some voices in the profession that favour the higher demand figure. The team, however, considered that it was too early to make such a forecast with any confidence.

28.8 *Main Conclusions from the General Insurance Sector*

28.8.1 The general insurance sector is growing in strength, with pressures for better financial management in pricing and reserving, amongst other areas.

28.8.2 All the trends suggest the need for greater actuarial involvement, although it will need the profession to prove that its tools and techniques can bring considerable value to the business as a whole. This could be achieved by the success of the Equitas project or greater competition that would force companies to seek better tools and advice to retain an advantage.

28.8.3 Compulsory certification (or an opinion) on the adequacy of reserves, if imposed quickly — e.g. due to the failure of a company — could produce an insupportable short-term demand. This seems unlikely, but, if handled tactfully, certification should come eventually.

28.8.4 Actuarial skills for general insurance work are founded on the present generic skills set. However, there is a clear need for the development of a specific general insurance package that demonstrates the particular applications of those skills in a general insurance environment. This is not achieved by this report.

28.8.5 Specific skills include:

— stochastic modelling techniques;

— dynamic solvency testing/financial condition reports;
— a clear understanding of the interaction of assets and liabilities; and
— an ability to approach problems of risk without recourse to volumes of historical data.

28.8.6 The minimum demand in 2005 would be for about 300 Fellows and 500 students. This compares with about 200 Fellows today (when demand exceeds supply). The maximum demand could be around 500 Fellows with 1,000 students. The team settled for an expected demand of some 400 Fellows and 600 students, but accepted that this could still be a little low.

29. *INVESTMENT*

29.1 The profession became involved in investment as one of the main side shoots of the growth model explained earlier. The move was probably a straightforward one, moving from determining the size and nature of liabilities of long-term funds to the investments. However, many believed that the profession did not spot the requirement to develop its investment expertise and, hence, found itself superseded by investment managers and specialists with qualifications and training that matched market needs. The advantages of theory allied to macro-economics and other skills have not been seized by the profession. Actuaries who have successfully left the more traditional work of advising pension funds and life funds have often found it hard to relate to the rest of the profession. They have made their careers using actuarial principles; but greatly enhanced by additional skills and experience.

29.2 The study team did not discuss this general proposition at much length, because in May 1995 Councils took a major strategic paper on 'The Way Forward for the Profession in Investment', (at Annex E) that covered the period through to 2005. In consequence, the study simply revisited the main arguments, and was quite satisfied that the 'Way Forward' paper matched its own view of the best approach for the future. This section of the report reviews the skills that may be required, and attempts to forecast the possible demand for actuaries. However, that demand depends on completion of the actions proposed by the 'Way Forward' paper.

29.3 *Trends to 2005 and Beyond*

29.3.1 Investment will become an even more specialist subject that will continue to require an intelligent mix of advanced mathematics and a basic understanding of asset liability modelling. The profession is well suited to provide training for this mix, but many of the present actuarial examinations are not relevant to a specialist career in investment.

29.3.2 Those professions and organisations which provide qualifications appropriate for the investment sector and can prove that they can react to the

need for a more balanced training will quickly become sector leaders. As presently trained, actuaries will steadily lose ground.

29.3.3 As discussed in both the life and the pensions sectors, there will continue to be an important role for actuaries at board level to give strategic advice on the main investment decisions for pension and long-term insurance funds.

29.4 *Confidence Levels and Shocks*

29.4.1 The team believed that it was likely that there would be little change to the current low involvement of actuaries in investment. The planned changes to the syllabus recommended by the strategy paper would not influence significantly the demand for actuaries for some 6-10 years at the earliest.

29.4.2 The few shocks that could increase the speed of this demand might include:

— an increase in the need for solvency management of pension funds as market values feed through more quickly; this has already been allowed for in the pensions sector work;
— the need for a compulsory certificate for investment bank reserves; this may be unlikely, and, in any case, others could meet this requirement if the profession did not improve its credibility in investment; or
— a significantly greater involvement by the profession in investment-related research, as currently being considered by the Investment Group, leading to a greater credibility for actuaries in some aspects of investment.

29.5 *Actuarial Skills Required in Investment*

The team's research and discussion confirmed the following requirements:

(1) There must be a clear understanding by all actuaries of the main types of securities in the market.
(2) All actuaries should have an increased understanding of the investment aspects of their work.
(3) Some actuaries should be trained to provide specialist investment services.
(4) The profession should provide specialists with significant mathematical expertise and professional responsibilities for the investment sector.
(5) A deeper training in stochastic techniques and option pricing would enhance the profession's position.

29.6 *Estimate of the Number of Actuaries in 2005 in Investments*

29.6.1 From the foregoing discussion, it is unsurprising that the team saw little change to the present requirement. The numbers involved at present (about 200 Fellows overall) would remain constant until the new education and training plans took effect. In relative terms, as the investment work expanded the proportion of actuaries involved would reduce.

29.6.2 The requirement for pensions actuaries to increase their understanding

of investments, as this work expands, has been allowed for in the pension forecasts.

29.7 *Main Conclusions for the Investment Sector*

29.7.1 The present small involvement in investments by actuaries reflects many years of inactivity by the profession whilst the investment world moved on apace.

29.7.2 Both Councils have approved a strategy paper on 'The Way Forward for the Profession in Investment', that covers the period of this study. The team checked the proposed actions and could find no area of disagreement.

29.7.3 The demand forecast (compared with about 200 Fellows today) will remain at 200 for quite a few years to come. The proposed course/exam, promoting significant mathematical expertise and a professional responsibility for investment, will take many years to come to fruition.

30. *HEALTH AND CARE*

30.1 The health and care sector, for the purposes of this report, is restricted to acute (e.g. PMI) and chronic (e.g. LTC) health issues, at present not covered by most life offices.

30.2 *Trends Today and up to 2005*

30.2.1 The well-discussed demographic forecasts imply an increasing total healthcare requirement. This has significant impact on finances in the public sector, with the consequential political debate. There is a general feeling that 'something must be done'.

30.2.2 Without a clear political and social policy, there is an increasing trend to private provision for both acute and chronic health care needs. The private provision is coming from both insurance and non-insurance products. However, both require the potential involvement of actuaries.

30.2.3 Whilst it is difficult to forecast any new social policy, all the evidence to date points to the need for a greater involvement of actuaries.

30.3 *Role for Actuaries*

The most likely work for actuaries includes:

— playing a key role in brainstorming possible solutions in the coming year or so;
— support for LTC insurance in insurance companies;
— advising NHS trusts and GP fund holders on forward planning and the interpretation of statistics;
— advising private sector providers;
— playing a significant part in setting up and running Continuing Care Communities (c.f. the U.S. experience);
— assisting in new employee benefit provisions; and
— additional work for pension actuaries, as pension products are more readily linked to LTC needs.

30.4 *Confidence Level and Possible Shocks*

30.4.1 Whilst the team is very confident of the trends, and hence the increasing involvement of the profession, it is difficult to forecast the speed of change.

30.4.2 Possible sudden changes would be brought about by:

— a clear government decision to encourage private provision in the sector by way of strong incentives; this would lead to an explosion in the insurance market; or
— a decision by government to develop a compulsory state scheme (funded as opposed to pay-as-you-go).

30.5 *Actuarial Skills Required in Health and Care*

30.5.1 The new skills required by actuaries in the health and care sector would be likely to be highly innovative. There will be a need for a fundamental understanding of investment tools and sectors (fixed interest, equity and 'housing'/property).

30.5.2 The strong human element in health and care will require communication skills in order to:

— analyse and explain solutions;
— understand the customers' needs and relate actuarial theory to the real effects of decisions on humans; and
— handle a high volume of health data and interpret it appropriately.

30.6 *Estimate of the Number of Actuaries in Health and Care in 2005*

30.6.1 There are presently only about 20-30 actuaries working as their main employment in the health and care sector. The demand for students is only just beginning to show.

30.6.2 Whilst accepting that the shock scenarios would both lead to a dramatic increase in the demand for actuaries, the team felt more comfortable forecasting a lesser demand. We selected a figure of 200 actuaries with relatively few students. In the most likely case, this 200 would be made up of some 100 new to health and care and the other 100 already involved in pensions/life. In other words there would be some overlap. A shock scenario could produce a demand for 300.

30.7 *Main Conclusions from the Health and Care Sector*

30.7.1 The health and care sector is clearly one of great change, with a growing public demand for resolution of the long-term care dilemma. It is unlikely that any government will produce plans whereby the state will pay the increasingly large bills for care. A combination solution of state provision for the less well off and a more radical, partly compulsory, scheme for others is more likely.

30.7.2 There will be an increased demand for actuaries, both to advise and lead with innovative thinking, as well as meeting the additional demand that would fall to the product providers in life companies and pension schemes.

Unless the profession develops the necessary innovative and commercial skills needed to lead, then the first of these two demands will not occur.

30.7.3 The number of actuaries working in health and care is very small, so even the expected increase to 200 would make little impression on the profession as a whole. However, it is a growth area, and will naturally attract actuaries from the life and pensions sectors. It has yet to reach the volume necessary to support students, but this should change shortly, and by 2005 there may be a few.

31. *WIDER FIELDS*

31.1 The team defined wider fields as those where actuaries were working using their actuarial skills and training as a key, if unwritten, component of their job specification, and this work did not fall within any of the other sectors of the report. For example, actuaries working in totally non-actuarial appointments in business were not deemed to be in the wider field.

31.2 The team noted that, despite some considerable time and effort over the past 2 or 3 years, the profession had not yet managed to identify and move towards completely new areas of work. This, to some degree, demonstrated the validity of the growth model described earlier in the report.

31.3 *Trends up to 2005*

31.3.1 Fellows and students will, for many reasons, continue to want to break off from the traditional actuarial promotion ladder and look for other work that makes use of their skills. This movement will increase during periods when supply outstrips demand for life and pensions work.

31.3.2 Those who establish themselves in new sectors will encourage others to join them.

31.3.3 There will be an increasing demand in the financial services sector for professionals who can demonstrate the ability to manage and explain the interlinking subjects of risk and finance.

31.3.4 Whilst the number of actuaries involved will be relatively small, they will expect the profession to support them and promote their work.

31.3.5 As discussed elsewhere, most actuaries do not see Fellowship as a stepping stone to another career. This contrasts with accountants. Whilst the Fellowship hurdle is so high this thinking will continue.

31.4 *Confidence Levels and Possible Shocks*

31.4.1 The study team felt confident that, with the appropriate education and training, most actuaries should be able to prove the added value that they could bring to many new sectors. However, they were much less confident that the present examination and training were sufficiently broad to achieve this. Equally, there would be resistance from people unfamiliar with an actuary's skills, as opposed to his or her reputation. Hence the predictions that follow are uncertain.

31.4.2 The most likely shocks that could affect the profession would be:

— large scale redundancy, either nationally or simply within the profession; or
— a major change in the profession's education and qualification processes, so releasing 'new Fellows' onto the market in larger numbers.

31.5 *Actuarial Skills Required in Wider Fields*

31.5.1 It is difficult to generalise on skills for wider fields, as, by definition, they are unlikely to be specialist. The generalist nature of much of the possible areas of new work will require:

— a clear grounding in the principles of risk and finance without over specialisation in life or pensions, for example;
— a tolerance for ambiguity, the need to use fuzzy logic combined with strong communication skills;
— well-developed team skills, with the essential ability to apply proven actuarial tools in new areas with adaptation; and
— an ability to think laterally, with the courage to try new ideas in a business world.

31.6 *Estimate of the Number of Actuaries in Wider Fields in 2005 and Beyond*

31.6.1 The present number of actuaries employed in the wider field (excluding health and care) is difficult to quantify. It is probably less than 1% of the profession (say 25-50 actuaries).

31.6.2 The team found it hard to justify a maximum forecast of as much as 200 by 2005. Even if driven by unemployment, this figure is unlikely to be exceeded. The expected demand is 100, with a minimum demand set at 50.

31.7 *Main Conclusions from the Wider Fields Sector*

31.7.1 Discussion on wider fields is sometimes confused until terms are defined. The team considered the actuarial wider field to cover fields where individuals used their actuarial training and experience to a reasonable degree in their work. Actuaries who use business skills rather than actuarial skills to advance their careers were outside this definition (this is the 'generalist' wider field).

31.7.2 The profession has a duty to take an interest in both groups, but the team believes that it has a greater duty to support the former. This responsibility could be met by ensuring that all actuaries have actuarial skills at a level to meet professional quality for traditional core actuarial areas, but that individuals are encouraged to seize opportunities outside core areas if they wished (soft encroachment, etc.). It is not the profession's responsibility to lead individuals towards such opportunities. It is important that this approach is agreed and accepted as the philosophy.

31.7.3 The present examinations appear to force over-specialisation in some of the traditional actuarial areas of work. This has evolved through time, but it makes it difficult for individuals to move to new work, as they are perceived by others to be specialists and not generalists. Whilst the numbers of actuaries

involved is small, the team believed that this specialist image is a fundamental point which the profession has to discuss.

31.7.4 The driving force behind the move to wider fields is primarily that of unemployment within the profession. Thus, typically, the debate is strongest during recession and recedes when there is no shortage of work. There is a strong argument that suggests that the profession would be ill advised to continue to almost hinder those who seek to move off the growth model. The training and Fellowship process could be adjusted to improve their chances, whilst not penalising the traditional areas. For example, a less specialised, but broader, qualification of Fellowship might meet this need, and also provide a reasonable stepping stone for those who wish to follow a general business career from the outset. These points are discussed again in Section 33.2.

31.7.5 That having been said, the demand for actuaries in the wider field is only expected to be about 100 in 2005, provided unemployment remains low. However, the number of actuaries who might move into business, using a solid actuarial training to a reduced level, could be many times this number in the long term. To encourage this to happen more actively, the profession would need to change its education system.

32. *ACADEMIA*

32.1 At present only a small number of actuaries work in educational establishments, and this includes a very few who do not teach actuarial subjects. Academic salaries are relatively low. Only an enthusiasm for research, teaching and training can overcome the draw of higher rewards of working elsewhere.

32.2 If *all* actuarial training were conducted within universities and colleges, then the proportion of actuaries required for this work would still be low. Even if there were to be a fundamental change in the provision of initial training (the extreme scenario would be to have *all* training up to Fellowship carried out in universities), the number of actuaries required for this work would be quite small and unlikely to have a significant effect on the conclusions of this study.

33. *OTHER ISSUES*

33.1 *E.U. and International Perspectives*

33.1.1 In Figure 7 it was shown that, of the 1,258 U.K. qualified Fellows living outside the U.K., 955 are living in six countries traditionally associated with the U.K. profession (Australia, Canada, India, Ireland, New Zealand and South Africa). Whilst it is to be expected that U.K. qualified actuaries will continue to be employed in these countries, there is an increasing move towards complete autonomy. For U.K. based Fellows, there is probably more scope for finding opportunities in other countries. The distribution of present employment outside the countries just discussed is as follows:

United States of America	105
Asia (excluding 38 in Hong Kong)	67
Europe (excluding U.K. and Ireland)	59
Americas (excluding U.S.A. and Canada)	32
Middle East/Indian Ocean (excluding India)	25
Africa (excluding South Africa)	15
Total	303

33.1.2 Whilst numbers in these countries are relatively modest, there is a good possibility that numbers will grow significantly. This will occur through the growth of 'global' consultancies and cross-border company mergers. The U.K. profession should be well placed to benefit from these moves. As well as already having a presence in many countries, the moves toward more product diversity, equity-based products, the 'Appointed Actuary' system and the growth of funded superannuation schemes are all developments which play to the strengths of the U.K. profession.

33.1.3 However, in order to service these emerging needs the U.K. profession will need to be able to adapt its knowledge and skills to suit different countries' needs. This argues for the basic qualification skills being based on problem solving, irrespective of specific market regulation, followed by specialist knowledge of certain areas of relevance to the particular Fellow. There is no doubt that there will also be flows in the opposite direction. In particular, companies and consultancies based in the U.S.A. are likely to have a significant influence on global or cross-border organisations.

33.1.4 International influences will also be important to actuaries who remain employed in the U.K. This will be particularly applicable as they are asked to give advice to U.K. based companies which operate in many countries. The potential in this area could be considerable. A doubling of those employed in the U.S.A., continental Europe and 'other countries' would increase demand in 2005 by about 300. However, any estimate would be highly speculative, and, therefore, no 'expectation' has been included in the supply/demand discussion. It is recommended that the trend in employment in these areas should be treated as part of the annual review process.

33.1.5 As well as tuition and examination issues, consideration should be given as to how the U.K. profession could help in increasing the contribution it can make to actuarial work outside the U.K.

33.2 *Actuaries in Business*

33.2.1 As discussed briefly in the wider fields sector, the profession has relatively few individuals who have used their actuarial training as a stepping stone to a general business career. This contrasts with, say, accountants, who regard the basic accountancy qualification as a starting point into many other areas. Fellowship is currently a formidable hurdle (with a failure rate of 60-70% after 3-5 years of exclusive specialist study following a first degree, success at about the age of 29, and with no official recognition for the 10-20% who fail at

the final examination). It is understandable that those who succeed have no desire to leave the actuarial career ladder unless pushed.

33.2.2 This Fellowship process is part of the pride and ethos of the profession, but the profession cannot then complain that, except in the rarest of cases, it has too few 'financial industrialists' in the board rooms of many of the major U.K. or world companies. If such a presence is believed to be a measure of the success and standing of the profession, then action would be required to change the present education process, especially the later exams.

33.2.3 The team was of the view that, whilst it would take many years to make any changes, it would be, in the long run, to the profession's and the industry's advantage to have a tiered education/qualification process that would allow many more young men and women to start a business career with a fundamental qualification that grasped the concepts of risk and finance. If the profession does not consider this route fairly quickly, then others will start to add such core actuarial skills in their education process, which will force the profession into more narrowly defined and restricted areas. Part of this change can be achieved by including more communication and general business skills to the present education process (including CPD); but this will not address the whole. There needs to be a point at which individuals have 'qualified', and can then devote themselves to a business career or can continue to specialise in more detailed actuarial techniques within specific actuarial disciplines.

33.3 *Personal Finance*

33.3.1 The profession does not, at present, consider that personal financial advice is a major part of its activities. The Institute authorises several firms, but, in general, stands aside to allow individuals to become fully qualified under SIB/PIA rules, and work in this sector. There is an argument that proposes that, with the availability of well-written software, the design of new products, and the introduction of personal tax assessment, this will attract additional demand for actuaries.

33.3.2 To some degree the arguments are similar to those in the wider fields section. The team saw an increased demand, but took the view that, provided that the profession had given future Fellows a reasonably broad based training, they should be able to move confidently into this sector. At present some 3% of those actuaries who call themselves consultants work in financial planning (both corporate and personal).

33.3.3 Personal finance could be an area of significant actuarial involvement, given the complexity of providing for the specific needs of the individual and promoting particular products which cover part of an individual's needs. The problem for the profession would be to develop a methodology which allowed the actuary to analyse most of an individual's needs rapidly in order to be able to concentrate professional effort on the unique features of an individual case. If this is not possible, then actuaries may not be able to provide such a service economically.

33.3.4 The team recommends that the profession at least conducts a pilot study to test the feasibility of using expert systems or other techniques for this purpose.

33.4 *Over-Supply Theory*

33.4.1 The team considered the quoted 'over-supply theory', which is based on the idea that, if the profession were to produce considerably more actuaries than the market requires, then the 'excess' would move into new areas, and quickly prove to others the merits of an actuarial education.

33.4.2 In practice, the profession does not control the number of recruits. U.K. actuarial students are taken on by cost conscious employers who would not accept such a philosophy. However, at its heart, the theory reflects the point made in the *Actuaries in Business* section (33.2).

33.4.3 An alternative version of the theory is that, if a profession creates a large over supply of members, they will, out of necessity, find employment, and that in doing so they will create new opportunities for others. A by-product would be generally to lower the price of the profession's services, at least initially. Given the steady growth of the profession in the past, the relatively small base of supply (mathematically orientated students), and the high value/high reward orientation of the profession, this version would only be an appropriate strategy if the alternative of evolutionary change were impractical.

IMPLICATIONS FOR THE PROFESSION

34. This section of the report pulls together the points and conclusions from the earlier discussion on the main sectors of actuarial business — both now and in the future. The arguments are not rehearsed again, but the collective implications are drawn out. In some cases the sectoral discussions offered a range of outcomes. Where these compound or balance, the report highlights this potential danger. Such areas clearly have to be monitored in future, or the range narrowed by wider discussion and subsequent agreement.

35. *DEMAND FOR ACTUARIES*

35.1 In each sector (life, pensions, etc.) the report has identified a range of demand for actuaries and has produced forecasts labelled minimum demand, expected demand and maximum demand. The figures were produced to the team's best ability after some, at times, heated discussion. They have not been formally tested outside the profession, although some team members obviously discussed the forecasts with non-actuarial colleagues. The demands were deliberately not accumulated during the discussions. This seemed a reasonably pure approach. At the final stage further checking was undertaken to balance out any of the possible overlaps between sectors.

35.2 As some 80% of U.K. Fellows are employed in either pension or life

work, it follows that a relatively small difference of opinion in these areas could change the expected demand considerably.

35.3 The team constructed a decrement model based on the present recruiting and education process and the split of actuaries amongst sectors. This model was then used to assess the level of recruitment required to meet a demand in 2005, and to determine the sensitivity of recruitment. The model was also used to determine the level of 'transfers' needed — e.g. from life to general insurance. A legacy of the team's work will be the spreadsheet model which can be adapted to cater for actual changes, or what-if scenarios. For instance, assumptions have been made about the distribution of times to qualification based on current experience. A change of approach could be tested based on actual or assumed data.

35.4 *Forecast based on Current Recruiting Levels*

35.4.1 With current recruiting (about 250 p.a.), no change in the examination success rate and a distribution by sector on the present basis, the supply/demand position in 2005 for Fellows is shown below.

Sector	2005 Supply	2005 Demand		
		Minimum	Expected	Maximum
General insurance	374	300	400	500
Life	1,850	1,200	1,500	1,800
Pensions	1,368	900	1,200	1,700
Education	45	25	35	50
Investment	236	200	215	250
Wider fields	21	50	100	200
Health	21	100	200	300
Total	3,915	2,775	3,650	4,800

35.4.2 From this the following emerges:

— The present level of recruiting will overprovide significantly in 2005 against the expected total (see also Figure 10) in life and pensions.

— Only the 'maximum demand' scenario would not require re-training.

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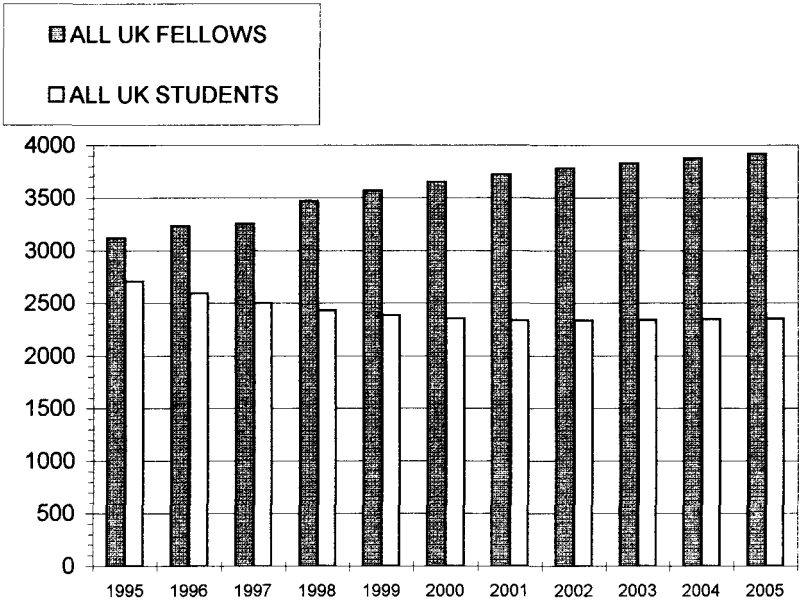

Figure 10. Forecast of the numbers of U.K. Fellows and students up to 2005

Figure 10 shows the projected growth in the supply of U.K. actuaries up to 2005, based on recruitment at 250 U.K. students p.a. This shows that the balance of the profession is gradually shifting towards a much higher proportion of qualified actuaries compared with students. This will be accompanied by an increased age profile of the profession. An issue not addressed in this report is the demand for student actuaries as opposed to Fellows.

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35.5 *Forecast based on adjusting Recruiting to meet Expected Demand*

35.5.1 The model was run to estimate the number of recruits needed each year to achieve the expected demand in 2005. If recruiting stopped henceforth, then in 2005 the outcome would be 3,579 against an expected demand total of 3,650.

35.6 *Forecast based on meeting Maximum Demand*

35.6.1 The model was run to produce the maximum demand total in 2005. The result was a requirement for students (based on present pass rates) varying from about 300 in some years to around 900 for the early years.

35.6.2 This demonstrated again the problems of the slow responsiveness of the training process to match sudden demand. This brings out the importance of having a transfer training process in order to meet high demand in one sector at the expense of another.

35.6.3 If demand did look as if it was going to exceed supply, the profession could probably respond to specific demand in a shorter time scale than is implied by the model — especially if it tried to anticipate events.

35.7 *Conclusions from Demand*

35.7.1 The estimated total supply of Fellows in 2005 will exceed expected demand (3,915 against 3,650) if recruiting continues at about 250 p.a. The supply is relatively inelastic due to the time required for qualification.

35.7.2 Even if demand is higher (e.g. equalling expected supply) there will have to be 'transfers' out of life and pensions, in the order of 350 and 50 respectively, to meet the expected demand. This is also likely to include a switch, of the order of 100 plus, from life offices to life consultancies.

35.7.3 In the extremes of minimum and maximum demand, considerable 'retraining' will be necessary, in the former case for those who seek wider fields work rather than leaving the profession, and in the latter case to help those who want to move to the area of highest demand (and salary). In high demand, many companies may set up their own in-house training in addition to any produced by the profession. Where there is no demand, those looking to move to wider fields may look to the profession to assist them. Thus, the profession needs to be prepared with a response.

35.7.4 Overall, therefore, the next 10 years present a challenge to the profession. In the latter part of the period supply is likely to exceed demand. As well as re-training, the profession and individual actuaries will need to develop and market their skills if demand is going to be enhanced to take up available supply.

36. *EDUCATION AND TRAINING*

36.1 In the earlier sections of the report the various skills required of actuaries working in their expected sectors (life, pensions, etc.) were examined

and discussed. Some of the difficulties caused by the present examination syllabus were also brought out. This part of the report does not repeat these arguments, but rather pulls them together to see the overall implications.

36.2 *Time to Qualify*

36.2.1 The time taken to qualify as a Fellow is not a new issue for the profession, and has been debated at length elsewhere. If there are no changes in assessment techniques or tuition, or if the 'volume' of the examination syllabus (breadth x depth) remains the same, then the length of time taken to qualify may be daunting, but will not affect materially the future of the profession.

36.2.2 There are two side issues that come into play:

— A 5-year post graduate course cannot seriously be considered as a 'stepping stone' or starting point for a professional business career.
— The time taken to qualify makes matching supply and demand very difficult, and can lead to cruel redundancies for students.

36.2.3 The profession cannot control the latter point, but the former, when taken alongside the discussion on the levels of qualification and the need to offer overseas students a course perhaps more relevant to their national requirements, points to the need to look hard at this issue. The team concluded that the present time to qualify for a U.K. Fellowship at the current 'volume' was just acceptable, but not appropriate for other possible options.

36.3 *Fellowship needs in 2005*

36.3.1 All the studies confirmed that the requirement for some individuals to hold a top qualification (but probably excluding Appointed Actuary certificates) will still exist. The status of the profession would be maintained if that degree of expertise is available. Investigations as to the work of actuaries in about 2005 across all sectors identified the need for:

— individuals who could turn their hand to many problems using sound actuarial techniques; and
— others who had acquired specific additional capabilities to meet the in-depth needs of a particular sector.

36.3.2 It was clear that the present system did not adequately meet the needs of the former, but, in the areas of life and pensions, the levels of specific technical expertise were high enough on qualification. The arguments from health and care, wider fields and, most importantly, that of providing all actuaries with a broad-based education were overpowering. However, a complementary process of topping up to the specialist levels in specific areas was essential. The team examined, as many others have done, the new proposals from the Institute of Actuaries in Australia, and were persuaded that the principles in this broad-based educational process are sound. It was not the task of this report to suggest titles

for such a new qualification, so it is referred to as the Standard Qualification (SQ).

36.3.3 The conclusions from the numerical demand for actuaries in the future highlight the need for the profession to provide a framework of education within which, or from which, each individual can attain his or her ambitions. There is clearly a possibility that the profession may reduce in size if it remains locked into its present fairly narrow approach. It will be able to diversify, spread and establish itself as both a high quality professional start point in the financial world and as the provider of complete specialists in certain sectors if it can produce individuals with an SQ and others who have gone on to SQ Plus.

36.4 *Skills Needed*

36.4.1 The specific skills anticipated are detailed in each sector. However, not surprisingly the lists had similar generic skills, but with some twists and specific points of focus.

36.4.2 The technical skills that were particularly identified were:

— stochastic modelling linked variously to:
  — assets/liabilities;
  — risk management; and
  — reserving;

— financial economics;
— understanding of investment instruments;
— financial condition reporting (e.g. DST);
— a broad based understanding of risk and finance; and
— the ability to apply these, together with the more traditional skills, to a wide variety of problems in an innovative way.

36.4.3 The general business skills that were identified were:

— project management skills — both the technical planning and the leadership aspects;
— communication skills;
— report writing — including its oral presentation;
— understanding the client/customer relationships and how to manage conflicts of interest; and
— interpersonal skills — selling, leadership.

36.4.4 The team was not surprised at the reappearance of many old chestnuts and of the seemingly short list of new technical skills. This showed that there were no major concerns, but rather shifts in emphasis. As in any profession, major changes in the education process must be infrequent and carefully thought through. The question of how far the profession should go in providing general business skills was not resolved. The general feeling was that, while the

profession could do more, employers also have a responsibility to train their staff in these matters.

36.5 *Examination Syllabus*

36.5.1 As mentioned at the start, this report has not looked in detail at the content of the current syllabus for examinations. The key points that came out in this study were:

— a broad, but uniform, depth of syllabus should be encouraged, especially to level SQ; this would produce a good understanding of the principles behind the techniques and an ability to apply them to various problems (not all related to insurance or pensions);
— a detailed and specific sector syllabus to take individuals to a higher level (SQ Plus and higher) to meet the demands of their chosen sector; and
— an increased emphasis on certain general business skills.

36.5.2 The specific sector education could be achieved through an assessed process, e.g. examination alone or by examination followed by non-assessed CPD in some combination. However, the SQ Plus concept would require formal tests and not just attendance at CPD events. The even higher level skills could be produced by CPD events.

36.6 *Examination Pass Rate*

36.6.1 As the low pass rate for the current examinations is the subject of considerable study, the team did not address it in any detail. However, the implications in future years of it continuing at its present low level arose during the study.

36.6.2 Various implications included:

— Combined with the length of time to qualify, it provides a barrier to those who might consider starting a business career in finance as an actuary.
— The implications on the demand model were discussed earlier in the paper.

37. *RELATIONS WITH OTHER PROFESSIONS*

37.1 The concept of a profession will continue to hold for the future. In the financial area there will continue to be 'turf battles', and not all professions will adopt the relaxed permeation approach of the actuarial profession. To maintain its position, the profession will need to:

— set the highest standards of professional quality in core-actuarial areas;
— keep its education and ongoing training relevant to today's and tomorrow's needs; and
— in so doing, prove that it is uniquely qualified to operate in the field concerned.

37.2 Competition must be welcomed and met. It is the last resort of any

profession to rely on statutory requirements to maintain its position. Such statutory work only follows from the other capabilities.

37.3 Multi-disciplinary partnership practices will increase, and should demonstrate to other professions the unique skills of an actuary. By so doing, the profession will also confirm the areas on which it can concentrate, develop and — following the growth model — become established.

37.4 A short discussion paper on the professions is at Annex F.

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

ANNEX A

THE FUTURE OF THE UNITED KINGDOM ACTUARIAL PROFESSION

TERMS OF REFERENCE

PURPOSE

To assist the U.K. profession to respond effectively to the changes and opportunities of the next ten-plus years.

TERMS OF REFERENCE

Output

1. Develop one or more scenarios to show where the U.K. actuarial profession should be planning to have progressed by the year 2005.
2. Identify the major changes and developments implied by those forward views.
3. Propose actions to take the profession in the desired directions.

Process

4. Review the ideas which were generated at the Institute Council Awayday on 26 September, which are summarised in the copy of Paul Coombes' slides and in the notes of the meeting dated 5 October 1994, and develop further those ideas which the task force believes merit further attention.
5. Develop such other ideas as the task force believes merit attention.
6. Consult widely within the profession and externally to seek and test ideas. This may well include forming supporting working parties to focus on particular areas of interest, and also especially involving younger members.
7. Other groups with whom particularly to test ideas include the Planning Joint Committee; the syndicates which worked on 26 September; other customers; and Council members generally.

Timetable

8. The task force should work to the following outline timetable:

(1) Review early ideas and plans at the Co-operation Joint Committee on 23 January 1995.
(2) Review more definitive progress at the Institute Management Committee on 20 April (and Institute Council on 1 May) and Faculty Council on 12 May 1995.
(3) Present final draft proposals to Faculty and Institute Councils in early July.
(4) Present proposals to the joint meeting of the two Councils on 25 September 1995.

ANNEX B

THE FUTURE OF THE UNITED KINGDOM ACTUARIAL PROFESSION

MEMBERS OF THE STUDY TEAM

P. J. Nowell, M.Sc., F.I.A.	-	Chairman
J. J. McCutcheon, C.B.E., M.A., Ph.D., D.Sc., F.F.A.	-	Deputy Chairman
P. D. G. Tompkins, M.A., F.I.A.		
K. A. Middlemiss, B.Sc., F.F.A.		
P. G. Scott, F.I.A.		
A. N. Hitchcox, M.A., F.I.A.		
J. Goford, M.A., F.I.A.		
A. C. Dash, M.A., F.I.A.		
E. A. Battams, B.Sc., F.I.A.		
R. J. H. Milne, B.Sc., F.F.A.		
E. M. Goodwin, M.Sc., Ph.D.		
G. B. L. Campbell, B.Sc.	-	Secretary

Additional members co-opted for part of the study:

D. A. Allwood, B.Sc., M.A., F.I.A.
E. W. Cooper, B.Sc., F.I.A.
P. L. Gatenby, B.Sc., F.I.A.

ANNEX C

LIFE OFFICE ANALYSIS — 1995

	Life offices 1995	Number of actuaries	Number of employees	Premium income £m	Ratio of actuaries to employees %	Actuaries per £m premium income	Transacting life/general business
1	Abbey Life	16	1,800		0.89		L
2	* Abbey National	4	1,400	126	0.29	0.03	L
3	Albany International	4	1,000	264	0.40	0.02	L
4	Allied Dunbar	15	3,300	1,462	0.45	0.01	L
5	American Life	3	130	101	2.31	0.03	G, L
6	Australian Mutual Provident	0	230	133	0.00	0.00	L
7	Axa Equity & Law	40	2,000	962	2.00	0.04	L
8	* Barclays Life	10	1,500	440	0.67	0.02	L
9	* Black Horse	7	2,100	523	0.33	0.01	L
10	* Britannia Life	15	942	160	1.59	0.09	L
11	Britannic Assurance	12	4,600	267	0.26	0.04	G, L
12	Canada Life	6	800	194	0.75	0.03	L
13	Century Life	0	350	63	0.00	0.00	L
14	Clerical Medical	28	5,000	1,020	0.56	0.03	L
15	Colonial Mutual	4	580	158	0.69	0.03	L
16	Commercial Union	55	9,700	435	0.57	0.13	G, L
17	C.I.S.	23	450	803	5.11	0.03	
18	Cornhill	7	2,500	104	0.28	0.07	G, L
19	* Direct Line Life Ins.	0	592		0.00		L
20	Eagle Star	33	10,500	583	0.31	0.06	G, L
21	Employer's Re	8	167		4.79		G, L
22	Equitable Life	29	2,000	2,101	1.45	0.01	L
23	Family Life	1	170		0.59		L
24	Financial Assurance	3	300	76	1.00	0.04	L
25	Friends Provident	49	3,600	847	1.36	0.06	L
26	GAN	6	800		0.75		L
27	General Accident	22	10,000	518	0.22	0.04	G, L

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

	Life offices 1995	Number of actuaries	Number of employees	Premium income £m	Ratio of actuaries to employees %	Actuaries per £m premium income	Transacting life/general business
28	Guardian	35	6,505	406	0.54	0.09	G, L
29	* Halifax Life	2	20,000		0.01		L
30	Irish Life	3	126		2.38		L
31	* Leeds Life	2	5,000		0.04		L
32	Legal & General	71	6,000	1,935	1.18	0.04	G, L
33	Lincoln National	13	1,500		0.87		G, L
34	Liverpool Victoria	6	600		1.00		L
35	Lloyds Abbey Life	0	10,000	786	0.00	0.00	L
36	London & Manchester	15	1,750	134	0.86	0.11	L
37	M&G	7	750	102	0.93	0.07	L
38	M & G Reassurance	3	800	454	0.38	0.01	G, L
39	Merchant Advisors Ass.	3	163	101	1.84	0.03	L
40	MGM Assurance	4	243	86	1.65	0.05	
41	* Midland Life	11	1,000	319	1.10	0.03	L
42	Munich Reinsurance	8	130		6.15		G, L
43	National Mutual	7	616	168	1.14	0.04	L
44	National & Provincial	4	3,400	31	0.12	0.13	L
45	* NatWest Life	9	3,196	543	0.28	0.02	L
46	NFU Mutual	7	2,200		0.32		G, L
47	Norwich Union	56	2,800	500	2.00	0.11	G, L
48	NPI	20	1,700	238	1.18	0.08	L
49	Pearl	35	2,400	625	1.46	0.06	G, L
50	Premium Life	1	70	26	1.43	0.04	L
51	Providence Capitol	8	390		2.05		L
52	Provident Mutual	19	1,300	452	1.46	0.04	L
53	Prudential	86	21,000	3,634	0.41	0.02	G, L
54	Refuge	10	3,500	104	0.29	0.10	G, L
55	Reliance Mutual	6	750	22	0.80	0.27	G, L
56	J Rothschild Assurance	3	850	246	0.35	0.01	L
57	Royal Insurance	37	2,170	774	1.17	0.05	G, L
58	Royal Liver	2	2,500		0.08		L
59	Royal London	9	4,150	2,798	0.22	0.03	G, L

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

	Life offices 1995	Number of actuaries	Number of employees	Premium income £m	Ratio of actuaries to employees %	Actuaries per £m premium income	Transacting life/general business
60	Royal National PF for Nurses	1*	120	91	0.83	0.01	L
61	* Royal Scottish Assurance	4	415	161	0.96	0.02	L
62	Save & Prosper	3	800	40	0.38	0.08	L
63	Scottish Amicable	41	2,400	1,086	1.71	0.04	L
64	Scottish Equitable	37	1,900	643	1.95	0.06	L
65	Scottish Life	24	1,360	537	1.76	0.04	L
66	Scottish Mutual	27	1,000	508	2.70	0.05	L
67	Scottish Provident	41	1,810	438	2.27	0.09	L
68	Scottish Widows	57	2,868	1,007	1.99	0.06	L
69	Skandia	12	550	439	2.18	0.03	G, L
70	Standard Life	81	6,000	3,391	1.35	0.02	L
71	Sun Alliance	48	14,000	443	0.34	0.11	G, L
72	Sun Life	10*	3,400	709	0.29	0.01	L
73	Sun Life of Canada	9	1,000	229	0.90	0.04	L
74	Swiss Life	5	450	140	1.11	0.04	L
75	Swiss Reinsurance	10	450	126	2.22	0.08	G, L
76	Teachers Insurance	1	200	35	0.50	0.03	L
77	* TSB	11	45,000	438	0.02	0.03	L
78	United Friendly	0*	350	126	0.00	0.00	G, L
79	UNUM	0	380	52	0.00	0.00	L
80	Wesleyan	7	1,500	97	0.47	0.07	G, L
81	Windsor	4	250	81	1.60	0.05	L
82	Winterthur	19	420	122	4.52	0.16	
83	* Woolwich Life	4	3,000	87	0.13	0.05	L
84	Zurich	12	3,200	79	0.38	0.15	G, L
	Average	16.3	3,177.3	491.6	0.51	0.04	
	Total	1,370	266,893	34,410			
	With Fellows in consultancies	1,488					
	Bankassurers average	6.58	7,012.08	310.78	0.09	0.02	
	Bankassurers total	79	84,145	2,797			

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Life offices 1995	Number of actuaries	Number of employees	Premium income £m	Ratio of actuaries to employees %	Actuaries per £m premium income	Transacting life/general business
Others average	17.93	2,538.17	439.07	0.71	0.04	
Others total	1,291	182,748	31,613			

Note: Averages and totals apply to those companies that have appropriate data.

* These figures are suspect, but are as presented.
* bank assurers

(Sources)
ABI List of Members: March 1995
DTI List of Authorised Companies: 1993
Nottingham University Research: Insurance Company Performance 1995

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

ANNEX D

LIFE OFFICE ANALYSIS — 1985

	Life offices 1995	Number of actuaries	Number of employees	Premium income £m	Ratio of actuaries to employees %	Actuaries per £m premium income	Transacting life/general business
1	Abbey Life	16	1,650	315	0.97	0.05	L
2	Abbey National	not formed					
3	Albany International	2	no figures	105		0.02	L
4	Allied Dunbar	11	2,379		0.45	0.01	L
5	American Life	3	no figures				G, L
6	Australian Mutual Provident	not formed					
7	Axa Equity & Law	35	1,700	217	2.06	0.16	L
8	Barclays Life	not formed					
9	* Black Horse	1	64		1.56		L
10	Britannia Life	not formed					
11	Britannic Assurance	7	4,427	113	0.16	0.06	G, L
12	Canada Life	9	800		1.13		L
13	Century Life	0	46		0.00		L
14	Clerical Medical	15	1,146	251	1.31	0.06	L
15	Colonial Mutual	26	1,100		2.36		L
16	Commercial Union	20	22,725	401	0.09	0.05	G, L
17	C.I.S.	16	2,000	267	0.80	0.06	
18	Cornhill	3	2,456	22	0.12	0.14	G, L
19	Direct Line Life Ins.	not formed					
20	Eagle Star	22	13,430	314	0.16	0.07	G, L
21	Employer's Re	1	13	71	7.69	0.01	G, L
22	Equitable Life	14	425	219	3.29	0.06	L
23	Family Life	0	no figures				L
24	Financial Assurance	0	no figures				L
25	Friends Provident	25	1,319	270	1.90	0.09	L
26	GAN	0	no figures				L
27	General Accident	22	10,300	143	0.21	0.15	G, L

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

	Life offices 1995	Number of actuaries	Number of employees	Premium income £m	Ratio of actuaries to employees %	Actuaries per £m premium income	Transacting life/general business
28	Guardian	30	9,726	324	0.31	0.09	G, L
29	Halifax Life	not formed					L
30	Irish Life	13	not returned				L
31	Leeds Life	not formed					L
32	Legal & General	44	5,855	799	0.75	0.06	G, L
33	Lincoln National	0	no figures				G, L
34	Liverpool Victoria	4	no figures	16		0.25	L
35	Lloyds Abbey Life	not formed					
36	London & Manchester	11	1,982	99	0.55	0.11	L
37	M&G	2	324	47	0.62	0.62	L
38	M & G Reassurance	24	no figures	192		0.13	G, L
39	Merchant Advisors Ass.	not formed					L
40	MGM Assurance	3	no figures	96		0.03	
41	Midland Life	not formed					
42	Munich Reinsurance	8	no figures				G, L
43	National Mutual	31	350	168	8.86		L
44	National & Provincial	0	not returned				L
45	NatWest Life	not formed					
46	NFU Mutual	0	no figures				G, L
47	Norwich Union	47	3,353	578	1.40	0.08	G, L
48	NPI	0	1,200	150	0.00	0.00	L
49	Pearl	18	9,062	288	0.20	0.06	G, L
50	Premium Life	not formed					
51	Providence Capitol	4	no figures	28		0.14	L
52	Provident Mutual	17	1,018	239	1.67	0.07	L
53	Prudential	87	21,715	1,542	0.40	0.06	G, L
54	Refuge	12	4,065	81	0.30	0.15	G, L
55	Reliance Mutual	2	600		0.33		G, L
56	J Rothschild Assurance	2	620		0.32		L
57	Royal Insurance	21	22,000	268	0.10	0.08	G, L
58	Royal Liver	2	3,000	60	0.07	0.03	L
59	Royal London	6	3,500	86	0.17	0.07	G, L

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

	Life offices 1995	Number of actuaries	Number of employees	Premium income £m	Ratio of actuaries to employees %	Actuaries per £m premium income	Transacting life/general business
60	Royal National PF for Nurses	1	no figures				L
61	Royal Scottish Assurance	not formed					
62	Save & Prosper	3	600	101	0.50	0.03	L
63	Scottish Amicable	25	1,732	454	1.44	0.06	L
64	Scottish Equitable	20	661	134	3.03	0.15	L
65	Scottish Life	23	554	77	4.15	0.3	L
66	Scottish Mutual	18	no figures	52		0.35	L
67	Scottish Provident	21	600	110	3.50	0.19	L
68	Scottish Widows	46	1,730	302	2.66	0.15	L
69	Skandia	7	not returned	37		0.19	G, L
70	Standard Life	55	2,070	660	2.66	0.08	L
71	Sun Alliance	9	9,047	294	0.10	0.03	G, L
72	Sun Life	26	2,400	390	1.17	0.07	L
73	Sun Life of Canada	9	1,500		0.60		L
74	Swiss Life	2	70		2.86		L
75	Swiss Reinsurance	7	no figures	12		0.58	G, L
76	Teachers Insurance	2	no figures				L
77	* TSB	2	45000	118	0.00	0.02	L
78	United Friendly	2	no figures	98		0.02	G, L
79	UNUM	not formed					
80	Wesleyan	3	2,000	33	0.15	0.09	G, L
81	Windsor	3	no figures	17		0.18	L
82	Winterthur	7	375	23	1.87	0.3	
83	Woolwich Life	not formed					
84	Zurich	5	144	26	3.47	0.19	G, L
	Average	13.54	4,642.35	219.56			
	Total	934	222,833	10,539	0.419	0.08	
	Bankassurers average	1.5	22,532	118			
	Bankassurers total	3	45,064	118	0.007	0.02	

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Life offices 1995	Number of actuaries	Number of employees	Premium income £m	Ratio of actuaries to employees %	Actuaries per £m premium income	Transacting life/general business
Others average	13.9	3,864.54	221.72			
Others total	931	177,769	10,421	0.524	0.08	

Note: Averages and Totals apply to those companies that have appropriate data.

Key: no figures — company unable to supply required information
not returned — company unwilling to give required information

* bank assurers

(Sources)
The Faculty of Actuaries (Year Book 1985 —86)
Directory of Graduate Opportunities (1985)
Nottingham University Research: Insurance Company Performance 1985

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

ANNEX E

THE WAY FORWARD FOR THE PROFESSION IN INVESTMENT

Discussion paper prepared by the Investment Committee for the Wider Fields Board, 5 April 1995, and submitted by that Board (with amendments) to Institute Council (1 May 1995) and to Faculty Council (12 May 1995)

(This paper was approved by Councils in May 1995)

We have been asked how the actuarial profession can regain its place in the investment field. This presumes that our place was once high and has now diminished. Is this true?

1. *Numbers*

1.1 Institute records do not show the numbers of members of different grades working in investment, but they do show the numbers who state that they are working in the 'Stock Exchange'. Table 1 shows the numbers and proportions of home Fellows and Associates in this field over the years.

Table 1. Numbers and proportions of home Fellows and Associates working in 'Stock Exchange'

Year	Fellows		Associates	
	Numbers	%	Numbers	%
1955	18	3.6	1	0.5
1959	18	3.1	3	1.9
1964	32	4.8	12	5.8
1969	36	4.8	15	6.4
1974	43	4.2	17	4.1
1979	52	4.1	15	2.5
1984	53	2.6	25	4.8
1989	48	2.5	17	5.4
1994	49	1.8	9	3.6

1.2 One can see the steady rise in the numbers until the early 1980s, and the gentle fall since then. However, the *percentage* in this field reached a peak in the late 1960s, and has fallen substantially since then. The reducing numbers may indicate that those working in the Stock Exchange are getting older, and fewer younger people are entering this field.

1.3 However, the Stock Exchange is far from being the only field where actuaries work in investment. There are actuaries in the investment departments of insurance companies, and many consultants who specialise in giving advice on investments. The Institute records show over 500 home Fellows who are interested in FIMAG (now called the Investment Group), and over 200 working in the investment field.

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

2. *History*

2.1 Forty years ago the actuarial examinations were the only ones available which included some aspect of investment. Since then, the Institute for Investment Management and Research (formerly the Society of Investment Analysts) has introduced examinations for the professional Investment Analyst (1979), as has the Stock Exchange (1970) subsequently through the Securities Institute (1986). The actuarial profession has, therefore, lost its unique place; but this uniqueness was a little unusual, and it is not surprising that it was temporary.

2.2 Forty years ago, too, many actuaries worked in the investment departments of life offices. In some offices the professionals in the investment department were entirely actuaries. Some of those actuaries were recruited into stockbroking firms or non-insurance investment management houses, in particular into gilt-edged departments. The particular advantage that actuaries had was an understanding of compound interest, which is a necessary, but far from sufficient, requirement for working in the fixed-interest field.

2.3 These conditions no longer pertain so much. Although many actuaries still work in the investment departments of life offices, our impression is that they are not so overwhelming as in the past.

2.4 Apart from the requirements of the Stock Exchange, professional qualifications in investment are not mandatory for those working in the field. Many investment analysts take the IIMR examinations. Probably few choose the actuarial examinations, even to obtain the Certificate in Finance and Investment, but some may do so.

2.5 The actuary's understanding of compound interest is no longer unique, and nowadays is far from sufficient for an understanding of the fixed-interest market, and in particular the fixed-interest derivatives market. For this market, in particular, the city has recruited 'rocket scientists', often mathematicians with a high level of understanding of stochastic calculus, which has now become the necessary pre-requirement for advanced work in the derivatives field. There is still some demand for actuaries because of their ability to deal with quantitative techniques in investment, but actuaries in general do not command respect from the 'rocket scientists' who consider the actuarial profession as being now a long way behind.

3. *Possible Approaches*

3.1 There are four approaches, not mutually exclusive, which the actuarial professional bodies could adopt:

(a) attempt to train an increased number of actuaries as investment analysts or investment managers;
(b) increase the understanding of all actuaries in relation to investment aspects of their work;
(c) train actuaries who can provide certain specialist investment services; and
(d) provide specialists with significant mathematical expertise and professional responsibility for the investment world.

3.2 These are four different aims, but they have been, to some extent, confused.

4. *Train Investment Analysts*

4.1 None of us thinks that (a) is a feasible or sensible objective [the Board accepts this view]. The investment management field is large. Organisations like IIMR and the Securities Institute operate as scientific or professional bodies within this field already. The jobs of investment analyst or investment manager are different ones from the job of actuary. Even though some people filled both roles successfully in the past and still do, it is by no means necessary to have an actuarial qualification to be a successful investment manager.

4.2 We suggest that this objective be put aside. Individual actuaries may find themselves in investment management, as they may in any other occupation. However, we should not compete with IIMR to train generalist investment actuaries, but should rather concentrate on training people who can provide specialist services which have added value.

5. *Present Policy*

5.1 We believe that objectives (b) and (c) are both desirable and both feasible. Further, they are in line with present policy in relation to the examination syllabus, and in relation to the activities of the Investment Group (formerly FIMAG). The particular fields that the Investment Group has identified as those where actuaries provide or could provide specialist investment services are:

— asset-liability modelling (including stochastic modelling);
— performance measurement;
— investment indices;
— manager selection;
— quantitative investment techniques;
— derivatives; and
— risk control techniques for fund managers.

5.2 Some of these items, such as manager selection, are not particularly actuarial, in that they require no special mathematical knowledge. However, most of the others do, and are relevant to the financial institutions that actuaries generally advise: life insurance companies, general insurance companies and pension funds.

6. *The Investment Actuary*

6.1 Objective (d) would be, in present circumstances, a new one. It seems to us that there is a requirement for experts in the investment field who are both mathematically trained and have professional responsibilities. Investment houses recruit many with mathematical training to carry out quantitative techniques, but they have no professional organisation to relate to.

6.2 A particular area where one can see that such an expert would be needed is in the management of derivative portfolios, and possibly the certification of the valuation and reserving of derivative portfolios of any financial institution, which, in this context, at present mainly means banks. We believe that actuaries could provide this role, which is analogous to the certification of life assurance, general insurance or pension fund valuations, but at present we are a long way from being able to put ourselves forward as such experts.

6.3 In order to provide such expertise, it would be necessary to have a considerably more advanced investment syllabus in the examinations than exists at present. Those wishing to become experts in this field might be willing to undertake a rigorous course of training for investment, but are unlikely to want to undertake examinations which would be three quarters about conventional actuarial subjects.

6.4 There is evidence that some further training in investment would be welcome — see how popular investment conferences are — but it is not clear what the volume of demand might be.

6.5 The question, therefore, is whether we could create a new branch of 'investment actuary' who underwent a considerably reduced training in the traditional actuarial fields and a considerably wider training in both investment practice and investment mathematics.

7. *Examination Syllabus*

7.1 We emphasise the examination syllabus because we believe that this is the one area which the professional bodies have directly under their control. The Institute and the Faculty can do little to appoint actuaries to jobs in the investment field, though they can give support to those who have chosen this field through providing CPD, conferences, sessional meetings, etc. and encouraging research. But the main line of attack must be, in our opinion, through the examination syllabus.

8. *CPD*

8.1 This is not to say that the other aspects are not important. The Investment Group is responsible for CPD and research in the investment field, and plans both a regular annual conference and suitable one-day or half-day seminars on relevant subjects. It has encouraged a number of working parties, and it cooperates with the Sessional Meetings Committee in providing papers for sessional meetings on investment topics.

8.2 So far in 1994-95 the plan for Institute Sessional meetings includes four papers, coming under the heading of different fields, which refer to investment topics. There is thus evidence of continuing interest in applications of investment principles within traditional actuarial fields. The programme of the Staple Inn Actuarial Society also shows interest in investment. Of the 11 papers in the 1994-95 session, three are investment-related.

9. *Education Review*

9.1 The Education Review Working Party of the Investment Committee is undertaking a substantial long-term review of the investment syllabus. The present investment syllabus seems to fall uncomfortably between two stools, with a partial objective of training investment analysts, and insufficient attention to modern mathematical methods. We think that this has come about for a variety of reasons: some of those responsible in the past have felt uncomfortable with mathematical and statistical methods applied to what they considered purely an art; others have felt that the elementary principles of financial economics were too naive to be applicable (but one must be careful not to give the even more naive impression that actuaries believe in a single fixed rate of interest, such as 4%, for all durations and terms, as the casual observer might think when studying some textbooks).

9.2 Further, textbooks on financial economics have tended to be either mathematically simplistic, or mathematically over-sophisticated, being either too simple or too difficult for the typical actuarial student who has a general competence in statistics and mathematics, but not necessarily at a high enough level. Few books distinguish satisfactorily between the short-term and long-term objectives of investment, and almost all accept the pure random walk model, which is satisfactory in the short term, but unrealistic as a long-term model for investments.

10. *Post Qualification Investment Syllabus*

10.1 One way of moving towards objective (d) is to introduce an advanced investment mathematics subject, taught and examined on the same lines as the existing subjects, but as a voluntary post-qualification subject, leading to an additional Certificate or Diploma. Besides being a step towards objective (d), it would also be useful in itself. Further extensions of this syllabus would be possible if it proved popular. We would, however, need to identify carefully who could teach and examine such a syllabus.

10.2 There are many organisations that provide investment education, either included in MBA or MSc courses (London Business School, Birkbeck College, ...) and we would need to establish whether the actuarial approach is sufficiently different for such an actuarial syllabus to be worthwhile. Views on this are likely to be divided. One can put forward the proposition that much of the academic training is analogous to 'theoretical physics' whereas the actuary can combine theory and practice as the skilled 'engineer'.

11. *Conclusion*

11.1 We therefore conclude that:

(1) There is no point in the profession attempting to train a larger number of actuaries as investment analysts or investment managers. Objective (a) should, therefore, be abandoned, though this does not mean that an

understanding of the main types of security in the market should not be required.

(2) There is considerable value in enhancing objectives (b) ("increasing the understanding of all actuaries in relation to investment aspects of their work") and (c) ("training actuaries who can provide certain specialist investment services"). This is being undertaken now by a detailed review of the investment parts of the syllabus and also by providing better, more focused, CPD.

(3) There seems to be a need for specialists envisaged in objective (d) ("provide specialists with significant mathematical expertise and professional responsibility for the investment world"). We propose to continue the work of the Education Review Working Party, to consult on the possible demand for such qualifications, and to make proposals for a suitable structure.

11.2 We ask the Wider Fields Board to consider this report, to agree with our conclusions, and to support our approach. [The Board endorses this report and submits it to Councils for further discussion and endorsement.]

A.D. WILKIE
12 April 1995

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

ANNEX F

CHANGES IN THE STATUS AND ROLE OF ALL PROFESSIONS

In the body of the paper there are many references to 'the profession' or similar phrases. The team often stopped to consider what 'the profession' actually was, and where its boundaries were in comparison to the individual professional or the employer of that professional. This Annex is a discussion paper which considers several aspects of this issue.

It should serve as a reference point in taking forward any proposals and, it is hoped, avoid the temptation for the profession to attempt actions which are really the responsibility of the individual or employer.

1. *Characteristics of a Profession*

1.1 Professions are characterised by two key attributes:

— the 'ownership' and development of a recognised body of knowledge and related skills which are applied by the relevant professionals in solving the problems of their clients; and

— rigorous control (through self-regulation) over standards of competence for entry into the profession and over the competence and integrity of individual members in applying the knowledge and skills of the profession.

1.2 In some instances, a particular area of knowledge embraces more than one professional body, each body regulating a distinct area of professional expertise and skill (e.g. law, medicine, engineering).

1.3 Through self-regulation, most professions are, in practice, monopoly suppliers of their particular professional expertise; in many cases, this situation has either arisen or been reinforced, directly or indirectly, through legislation (e.g. Appointed Actuary, statutory auditor, etc.).

1.4 Generally, the monopolistic position of professions has not been regarded as anti-competitive. Indeed, the effective regulation of professional practitioners is essential to protect the public interest. Continued public acceptance of self-regulation (and self-determination) is inevitably dependent on public interest issues being seen to take precedence over the protection and promotion of the interests of the professions.

2. *Critical Success Factors*

2.1 Critical success factors for professions are:

— public/client confidence;

— client satisfaction;

— awareness of the role of the profession among potential clients and relevant opinion formers; and

— continued relevance of the profession's particular expertise (knowledge base and skills).

2.2 The continuing success of professions is dependent on their ability to meet these factors whilst facing increasing change and uncertainty in the external environment. Whilst all professions are having to adapt to external change, the impact varies considerably among different professions.

3. *Factors Impacting the Development of Professions*

3.1 Client demands:

— Economic and competitive pressures will increasingly force clients to adopt a tough approach to their need for professional services and the quality and value for money of the services provided.
— Clients will increasingly face issues which require resolution through the input, simultaneously, of more than one area of professional expertise.

3.2 *Technology*

— Most professions recognise that technology will continue to result in the de-skilling of some current areas of professional activity.
— For many professions, technology will enable either better solutions to be developed to address clients' problems, or existing professional skills to be developed more cost-effectively.

3.3 *Legislation*

— Changes in legislation will continue to have a major impact on the nature and demand for the services of some professions. For most professions, the incidence of legislative change is unpredictable.
— Professions with statutory or quasi-statutory roles face potential threat from government deregulation initiatives.

3.4 *Industry specificity of core competencies*

— The skill set and core competencies of some professions are associated strongly with specific industries/clients (actuaries, loss adjusters), whilst others are applicable across a wide range of industries (e.g. accountants, lawyers). The development of industry-specific professions is closely linked to the development of their relevant industries.

3.5 *Professional specificity of knowledge base, skills and competencies*

— Whilst all professions have core skills and competencies (derived from the application of a particular knowledge base) which are associated with the particular profession, the knowledge base and skill set of some professions is less 'proprietary' than others.

4. *Common Issues of Professional Bodies*

4.1 Whilst environmental change differs in its impact on the various professions, many current issues and concerns are common amongst a range of

professional bodies. These arise from the pressures of managing change and the increasingly complex environment in which all professions operate.

4.2 Issues which are common amongst a range of professions include:

(1) maintaining/developing skills and core competencies:
- — core subjects for professional examinations;
- — role of continuing professional development (including scope of sponsored CPD); and
- — self-development for individual members;

(2) self-regulation:
- — scope of guidance to members (statutory/quasi-statutory roles or wider fields);
- — regulation of wider fields involvement; and
- — impact of increasingly complex environment and client expectations of professional competence;

(3) two-tier professions:
- — increasing pressure to recognise a more limited technical/vocational qualification;

(4) multi-professional practices:
- — regulation;
- — blurring of professional competencies/public confusion; and
- — encroachment between professions;

(5) image and standing:
- — maintaining/enhancing the image and standing of the profession;
- — increasing public awareness of the role of the profession; and
- — enhancing the influence of the profession; and

(6) development of the role of the profession and its members.

ABSTRACT OF THE DISCUSSION

HELD BY THE FACULTY OF ACTUARIES

The President (Mr G. M. Murray, C.B.E., F.F.A.): Tonight we are to discuss the paper 'The Future of the Profession'. The initiative for this work was begun by the Institute. It was thought that this was a suitable topic to discuss at a day away for their Council in September 1994. Because of the topic, it was thought it would be appropriate to invite me to attend. I was delighted to do so and participated fully in the discussions.

Arising from that meeting, Mr Daykin, the Institute President, and I formed a task force to take the matter further and to produce a document on the future of the profession. Mr. Nowell was the chairman of that task force, which has done an excellent job in covering a large topic in a very tight timescale. We are grateful to those people for having met the timetable to allow us, in the first instance, to discuss the report at a Joint Council Meeting, which took place in Birmingham in September 1995.

This proved to be very positive. There was an interesting and worthwhile discussion. It was felt that what had been produced was appropriate to be put forward to the profession in the United Kingdom, and tonight we are in the position of being the first to hold a public debate on this report.

Mr R. J. H. Milne, F.F.A. (introducing the report)**:** When I left Heriot-Watt University in 1982, the standing joke was that graduates aspiring to be actuarial students simply cast their eyes around St. Andrew Square and selected the life office that they would grace with their presence. The graduate then phoned that life office and was most disappointed to find that the office actually wanted to interview the graduate for the position. The graduate need not have been concerned, because it was quickly discovered that this was merely so that they could put a face to the name.

The point of this little tale is that, for a long time, actuarial employment was almost guaranteed, both for those who wished to sit the exams and, even more so, for those who were qualified. However, in the last ten years the profession has had to witness a significant change, with reducing demand in certain fields, and even with some actuaries being made redundant. Who knows what the next ten years will hold; what pressures will be on us; and to what extent we will be masters of our own destiny?

In the report we have attempted to look forward over that ten-year gap, and, in true actuarial fashion, have produced estimates and confidence intervals for the supply of, and demand for, actuaries for each type of employment.

I am sure that you are aware of the stories about lawyers not having their own wills, and how, in a street, the builder's house is always the one most in need of repair. How many of you would claim to have adequate life and pension provision? It is probably no surprise that we found that little attention had been paid to putting together a decrement table of the numbers employed in the actuarial profession in the U.K., and to projecting this forward. This has now happened, and appears in Section 35. At current recruitment levels, and without a change in the average length of time for qualification, we estimate that the supply of U.K. actuaries in the year 2005 will be 3,915. The other side of this equation is the likely demand. While this is a much more subjective area, the task force spent much time and effort building estimates in each area of employment and producing a central combined estimate of 3,650 actuaries, in a range going from 2,775 to 4,800. This suggests an oversupply of some 300 in ten years' time.

We hope that the discussion on this topic within the profession over the next few months will help us to see what the most likely number really is. One statistic which surprised us was the inflexibility of the supply line in relation to the recruitment level. The assumption of current recruitment is about 250 students a year. If that fell to nil with immediate effect, the supply in ten years' time would be just short of 3,600 — a fall of only 300 qualified actuaries. That roughly matches our central estimated demand figure.

The only thing that we can be certain of is that our estimates for the year 2005 will prove to be incorrect. However, in all areas of work, we see that actuaries will require more risk management skills; will be more involved in project teams; and, therefore, will have to have more job mobility, particularly away from the core areas of life and pensions, into health and other wider fields. I understand that the Institute, at least notionally, has considered changing its motto from 'Certainty out of Uncertainty', to 'Less Uncertainty out of Uncertainty'!

As regards education, our report indicates ways in which the structure and the CPD could, and probably should, be changed. We suggest that the standard qualification should be more skill orientated and less knowledge based. Expert modules should be used to build on this to suit the individual actuary's needs and work areas, both in the U.K. and overseas. These could serve for an initial standard and for CPD retraining purposes. We have not recommended exactly how this can be done. That is for the profession and the Education and CPD Board to debate. However, the approach currently being recommended to the Society of Actuaries in the United States of America by its education task force is not dissimilar, and the Australians have already gone down a similar track.

One thing I am certain about is that we must take this issue seriously. Our profession is not guaranteed a future, and we may have to devote more resources to mould this than previously.

Five years ago the Faculty marketing research group carried out a marketing audit of the profession (*T.F.A.* **43**, 14), and reference is made to this in the report. One of the concerns expressed in the earlier analysis was about the image of the profession portrayed in the national press. It was particularly relevant because of the influence that the national press has on the perception of the profession among recruits and employers. Let me remind you of some of the quotes that were made then. *The Guardian* said, "He picks his words with the care and conspicuous lack of passion which one would expect of a graduate in maths and economics who then trained as an actuary". *The Independent* said, "Actuaries should go back to their calculators, let them loose on anything more exciting, and they lose their customary reserve." In 1990, *The Times* carried my favourite: "If only he had the voice and physical presence to match the words, it is the new Prime Minister's misfortune to sound like an actuary rather than a statesman".

I have also scanned the press over the past few months to see if matters have improved. You may be disappointed to hear that according to Lloyd's List, actuaries are renowned the world over as "being in the most boring profession". Then I found the following in *The Mail on Sunday*: "The Institute of Actuaries, the august body that represents the grey individuals who spend their lives working out the probability of death and disaster, is debating whether to appoint a Chaplain. Using one side of the paper only, draw your own conclusions".

The Independent and *The Scotsman* had this to say about us: *The Independent*: "These have been confirmed following a profoundly depressing drink with an ACTUARY (there being no such thing as an enjoyable drink with an ACTUARY)"; *The Scotsman*: "Others to flood in — a body of Undertakers, a dither of Government Ministers, a lie of Politicians, a bore of ACTUARIES, a shrivel of Naturalists".

This report is not a prophecy of doom and gloom. At the end of the day the elasticity in the demand curve for actuaries will probably quite easily absorb any variations in supply. However, we firmly believe that the profession has to take a serious look at the issues raised in this paper, and develop a proactive rather than a passive strategy. There is no doubt that we have been through a period of change, and there is more to come. How many of those present here would have imagined, ten years ago, that today the Faculty would give up 23 St Andrew Square permanently or be discussing what is, in effect, an operational merger with the Institute?

Mr J. S. R. Ritchie, F.F.A. (opening the discussion): The report that we are discussing is very long, deep and wide. This is not a criticism — indeed, quite the reverse. The report has done our profession a great service by giving us a major platform to plan and manage for the future.

I start at the beginning, which is the work done by Mr Paul Coombes, a management consultant. He defined four options available for the profession: retrenchment; hard encroachment; soft encroachment and relaxed, self-confident permeation. Councils agreed that a combination of soft

encroachment and relaxed self-confident permeation was preferred. However, this view is clearly not unanimous within the profession. I quote from a letter in the November 1995 edition of *The Actuary* magazine:

> "I am extremely bullish regarding the current opportunities for the profession — we need more actuaries within the economy as a whole, as our skills are woefully under-represented in many areas, and the economy could easily accommodate three to four times the current number of actuaries. The profession needs to target these areas and provide the skilled people to undertake the work."

This sounds very like hard encroachment to me! How many within the profession share the views of the letter writer? Is the letter writer correct or are Councils correct?

One way to help us decide would be to analyse the 'woefully under-represented skills' to which the letter writer refers. Mr Coombes also implied such an investigation when he recommended that any study of the profession's future role should start with an honest self-analysis. The authors acknowledge, in Section 16, that the self-analysis undertaken "did not go to the depth that Coombes suggested". I do not understand why the team rejected Coombes' suggested rigorous approach. As I read the report, the questions kept coming up in my mind again and again: "What is an actuary?", "What makes us different from others?", "How can we add value in unique ways which justify our existence and future growth?", "What peripheral skills gel most easily with our core skills?". I could make an attempt at answering my own questions, but I could be wrong, and my answers could be at odds with those of other members of the profession and, more importantly, with those of the users and potential users of our services. I suggest that we should take the time to go back and undertake the fundamental work which Coombes suggests. It may simply confirm what we think we already know. If so, it strengthens our confidence in our foundations. If not, the sooner we are aware of the truth, the better.

I have one other fundamental point to make: what criteria guide our decision making for the future development of the profession? Is it in our own interests that we develop the profession or is it in the public's interests that we develop the profession? If the latter, which public are we talking about: the public who use our services; the public who pay for our services; or the public who are affected by our services? Is it the U.K. public, the European public or the world public? I suspect that the answer is some combination of our own interests and a general public interest, and that reference should be made to our Royal Charters to help us to be clear. However, we should be clear about our fundamental objectives as a profession before taking major structural decisions designed to set us up for the 21st century.

The report deals with 'The Profession Today' in Sections 18 to 23. I was particularly interested in the actuarial population statistics in Figures 2 and 8, and the projection in Figure 10, as they give us an insight into our own demography. It might be helpful for the future to develop this — for example, how does our demography compare with that of other professions and with that of the general population? This might give us useful pointers in areas such as sexual bias, and any ageing problems which are acting differently on our profession — for example, if we are in competition, in 2020, with accountants whose average age is 35, while we have an average age of 55, that has to have a bearing on how we behave.

The self-analysis in Section 21 is very interesting, as far as it goes. The strength of ¶21.1(2), "actuaries are recognised as highly qualified, technical individuals", is one side of the coin, and some of the concerns are collectively the other side of the same coin — in particular ¶21.2(1) (the length of time taken to reach fellowship), ¶21.2(2) (the continued high failure rate of 'experienced' students), ¶21.2(4) (an over-emphasis on obscure methodology and legislative correctness) and ¶21.2(8) (perception of actuaries as narrow specialists).

The length of time taken to reach fellowship is a particular concern, although we can, perhaps, comfort ourselves that we may not be the worst. It has recently been reported that candidates for the examinations of the Institute of Actuaries of Japan passed 683 subjects out of 5,294 sat, including 74 out of 359 at the advanced level. Two of the prime reasons for the poor pass rates in the later parts of our restructured examinations are a lack of the ability to apply theory in practice and a lack of

ability to communicate effectively. These shortcomings among candidates in the new examination regime look remarkably similar to the concern given in ¶21.2(5), namely, "a lack of business awareness and communication ability". I am tempted to wonder whether this may mean that many people have qualified in the past without possessing those skills, and, therefore, that we should be putting a strong emphasis on CPD in these areas.

'The Position in 2005' is dealt with in Sections 24 to 33, and these form the core of the report. Sections 25.1 and 25.2 make some general points about the opportunities for U.K. actuaries to export their skills overseas. I get the impression that, in many European countries, the actuary is very academic and not commercially oriented in the way that most U.K. actuaries are. As such countries develop their needs for greater private long-term provision, the opportunities for U.K. actuaries must be considerable, though I suspect fairly temporary, as governments will naturally wish to develop home-grown actuaries with appropriate skills.

There seems to be conflict between the first item of ¶25.3.2 and the first item of ¶25.3.3. Each strand of an unbundled product may be simple when viewed in isolation, but when viewed in the round it is still complex. This, in itself, could be good for our profession, as it increases the need for sophisticated independent advice.

The life assurance sector is the largest employment area for U.K. actuaries, and faces significant restructuring. The third key issue in ¶26.3.1 is "the ability of offices to manage financial strength". I would extend that by adding the phrase "and the ability to communicate that financial strength". There appear to be some quite strong offices which are showing low free asset ratios, because either they are using strong valuation bases or following a high equity investment policy or a mixture of the two. I wonder if such offices have thought through the need to market this strategy in simple terms if their new business is to be optimised?

In ¶26.4.1 it is forecast that "there will be significant pressure on expenses which will result in a considerable number of cost-cutting exercises in the industry". This sentence carries ominous significance for those offices which start from a position of high overheads and falling sales. Many such offices seem to be intent on buying business, and are struggling to do even that. Current financial strength buys time, but, unless the business can be rapidly refocused, it will just delay the inevitable. I believe, therefore, that the authors' conclusions in ¶¶26.4.6 and 26.4.7 are correct, namely that the future will be bright for those who can efficiently distribute competitive and flexible products, but that roughly 30 or 40 existing companies will not survive.

In ¶26.5.4 the authors touch on compulsory private pensions. I agree that this would tend to reduce the need for actuarial expertise, but that is happening anyway because of the swing from final-salary to money-purchase, which is very pronounced at the smaller end of the market. I believe that the challenge to the actuarial profession with money-purchase is to provide cost-effective advice tailored to the needs of the client. For example, at the lower end of money-purchase, it could be on a 'wholesale' basis through an independent financial adviser, and at the higher end it could be on a 'retail' basis, where the actuary provides the high net worth client with individually tailored advice. To achieve these things, we need to communicate effectively how the actuary can add value in money-purchase — an area where, to date, we have only scratched the surface.

In ¶26.6.1(3) the authors refer to the fact that the actuarial profession has made little impact in derivatives work. I wonder if it would be instructive to hold a full post-mortem on this issue. We might learn lessons about how to make sure that we are in early on new developments where our special skills are valuable, and we might even find that the derivatives corpse is, in fact, capable of resuscitation!

In the pensions section, there is a long paragraph, ¶27.3.3, on money-purchase. Two points not mentioned are changing patterns of employment and the trend towards flexible benefit packages. Money-purchase seems more suited than final-salary to people who are going to change jobs half a dozen times or more during their working lifetime. Also, money-purchase contributions are directly costed in a flexible benefit package, whereas a final-salary benefit has to have a capitalisation factor applied, based on assumptions which may prove highly inaccurate for the individual concerned. If both these trends are sustained, I suspect that we may be looking at a permanent change to money-purchase, and not a pendulum effect. This suspicion is strengthened by the doubt about whether even

large employers will wish to stick with final-salary scheme costs, which are difficult to pin down, appear to be rising, and do not appear to be essential to the efficient running of their businesses.

On general insurance, I have a slight unease about the position of a young Fellow who may be the only actuary in the company. Some similar problems arose in the early 1970s, with the boom in new life offices at that time. It would be a considerable setback for the profession if a similar problem were to occur in general insurance now. I am sure that the General Insurance Board is well aware of the need to support young or isolated actuaries, and trust that individuals in general insurance are aware of the potential problems, and will know that the profession is only too willing to assist. Forewarned is forearmed.

On health and care, the profession is indebted to those actuaries who have pioneered our entry to this area. It is an object lesson in demonstrating how the profession can add value in a new field, and gives us a great launching pad for employment growth.

In ¶33.2.3 the authors comment on the desirability of having a tiered education/qualification process that would "allow many more young men and women to start a business career with a fundamental qualification that grasped the concepts of risk and finance". I have sympathy with the point, but am unclear about whether such people stay part of the actuarial profession or not. At its most basic, do they pay annual subscriptions or not?

Much of Sections 34 to 37 is about education and training, and one can easily envisage a three-tier system, namely a diploma in actuarial techniques, a broadly-based Fellowship and a regime of practising certificates for the specialist areas. If there is general agreement towards change along these lines, that is fine; but remember the poor student, and let us not rush into further major change for those currently wrestling with the last one. One particular aspect of this is to make sure that the training and the examinations are moving in a synchronised manner. There is no point blaming the poor examiners for low pass rates if the real problem is that candidates have not acquired the problem solving and communication skills which the profession demands of newly qualified actuaries.

Professor J. J. McCutcheon, C.B.E., F.F.A.: I comment on an area which is of special interest to me — the education and training of actuaries, and to matters pertaining thereto. If I were to produce a short list of criteria or conditions and to say that, if these were to be satisfied, we could guarantee all actuaries a rosy future, I would be deluding myself and misleading you. However, we must surely agree that the following four conditions are essential prerequisites for the long-term well-being of our profession:

(1) We must continue to attract a steady supply of high calibre and well motivated students.
(2) We must ensure that our educational process is such that as high as possible a proportion of these students achieve our qualification standard — and, of course, we must be clear in our own minds exactly what that standard is.
(3) We must ensure that the knowledge and skills acquired by our students in the course of qualifying are continually reviewed — so that they reflect, not only the rapid pace of technological advances, but also the consequences of significant changes which may occur in the markets in which we operate.
(4) We must have in place an adequate system of CPD provision, to enable our members to update their professional skills on a regular basis, so that they provide their employers and clients at all times with advice of only the highest quality.

In forecasting the size of the profession over the next decade, the working party could not predict any significant growth in student recruitment from its current level. Indeed, as Mr Milne has mentioned, it was our opinion that current U.K. recruitment levels are likely to lead to an over-supply of actuaries in the life and pensions areas within the next ten years. Clearly, we should strive to attract the most able graduates. There is some evidence that, in recent years, many of these young people have consciously declined to join our profession. This leads me to think that, in the years ahead, we shall have to compete for our new blood more fiercely than ever with other professions and industries. It is no use burying our heads in the sand and saying that this is a problem for employers. It is very much the profession's problem. While there is an obvious responsibility on employers to assess the

motivation of job applicants, the profession has an equally clear duty to demonstrate to those suitably qualified to start out on the journey that there are attractive and reasonably secure routes to qualification. This message must be loudly and widely proclaimed.

In Section 32 the working party reminds us that very few actuaries work full-time in the academic world, and points out that, even if there were to be a significant expansion in this area of employment, the number of people involved would still be low. I am sure that this is correct. My own view is that it is preferable to have a small number of universities, each with a solid core of full-time actuarial staff, than a larger number of institutions, each with a very small, or even only part-time, actuarial staff. An adequate core of good quality full-time actuaries is essential — if only to ensure that significant worthwhile research is carried out.

Although academic actuaries are few in number, they are in a position to contribute to the profession's work in many ways and at a variety of levels — for example, from the preparation of core reading for basic actuarial skills to leading high level CPD courses in areas where individual research interests are at the front edge of the field. While the first of these examples is purely educational in nature, the second illustrates how academic actuaries may play a significant role in the analysis of practical business issues.

Three years ago, in my Presidential Address to the Faculty (*T.F.A.* **44**, 1), I acknowledged, with gratitude, the fact that, in this country, initial suspicions had been largely overcome, and that university actuaries then enjoyed the support and encouragement of most, but not all, members of the profession. In both teaching and research, many academics are at the forefront of their subject and, despite relatively limited resources, have much to contribute if they are given the opportunity to do so. Co-operation between members of the profession working in the business world and their academic colleagues, can only be mutually advantageous. Long may it continue!

The opener referred to ¶33.2.3, where the working party expresses a possibly somewhat controversial view, and suggests an action which, if implemented, could have major long-term consequences for the profession. In my view, the ideas contained in this paragraph are important and worth further study. The one thing I ask, however, is that in all further reviews of our educational process, we do not lose sight of what is, perhaps, the most distinctive feature of our profession. I refer to the mathematical skills of its members and their related and considerable abilities in the mathematical modelling of uncertain events. In making further changes to our education process, we will overlook these abilities at our peril.

As we move towards the 21st century, we cannot afford to stand still and simply watch the world pass by. An entirely passive response to events may well cause serious problems, and this is as true for our profession as it is for other organisations. Realisation of this fact was one reason for the commissioning of the study which the working party has produced. We must react speedily to, and, whenever possible, anticipate, the challenges which will confront us in the years ahead. For this reason, a wide discussion of this report can only be of great benefit to us all.

Mr R. M. Paul, F.F.A.: I will begin by declaring a double interest in the study. First, I am one of an unfortunately growing number of actuaries who have been the casualty of a corporate restructure. In my case, I quickly realised that Appointed Actuary roles are not in great abundance, while such specialisation does restrict the ease of moving into other areas where the expertise is, at best, rusty and, at worst, forgotten. This is particularly relevant with the professional guidance, which states than an actuary must not offer advice or service in an area in which competence is not at the required standard. The problem, therefore, is how to get that expertise without infringing these professional requirements. The second interest which I declare is that my daughter is an actuarial student who has reached that mid-stage where, after some years, the end still seems far away, but not to complete would mean that those hours of study are wasted. Not only do I hope that she completes the exams, but, more importantly, that there are attractive opportunities available providing suitable reward for the sacrifices in the exam years.

The profession is regarded almost with reverence as far as the difficulty of the examinations is concerned, but few people seem to know what an actuary does, or even, more importantly, what an actuary is good for, apart from core activities in life assurance and pensions. The first question to ask

is, why are the exams so hard relative to those of other professions? Is it because they need to be, or is it to maintain the exclusivity of a small profession, where the anticipated potential uses for the actuary's skills, at least at present, are restricted to certain specialist functions, and there is a need to limit the numbers?

Thus, the choice is whether to change the examination criteria to make them less rigorous, with specialist options, and possibly lose that reverence, or maintain the standard, and possibly restrict the opportunities in other areas which might otherwise become available. In this respect, it is worth remembering that, no matter how hard the exams are, the real expertise of the actuary is gained after qualification, from applying the theoretical knowledge gained from the examinations to practical problems. However, if the exams are not sufficiently rigorous, then the base is not there to apply to these problems.

The difficulty with the specialist option is the potential restriction to an actuary wishing to change direction, unless that actuary is prepared to undertake another specialist examination or extensive CPD. The problem with the second option is that the actuary remains a sort of guru figure who, outwith the confines of specialist expertise, is not understood as having something to offer in the wider market.

Little is said in the study about actuaries who choose the generalist wider field and no longer use their basic actuarial knowledge. However, an actuary does not have to leave the life and pensions areas of work to be in a similar position. There are several actuaries in life companies whose prime responsibilities are virtually divorced from any actuarial requirement, such as in general administration, human resources, or straightforward investment roles, and, perhaps, even chief executives who have moved quite far from the actuarial base. This is not a bad thing, and, indeed, should be encouraged if that is what the actuary desires.

The generalist abilities of the actuary are recognised in life companies, but the actuarial training is not recognised as providing a generalist expertise in other industries. This is unlike, for example, accountants and economists, who are employed for their particular skills as 'the accountant' or 'the economist', but gradually shed the more specific requirements as they progress up the ladder of seniority. This creates a barrier to actuaries wishing to move into the generalist wider fields area. They either join a company with no specifically recognised skill, and certainly will not be offered an actuarially-related salary, or are appointed at the most senior managerial levels, where the demand is for the generalist management skills themselves. There have been a few such moves, although there is no reason why actuaries who have proved that they can manage life companies and consultancy practices should not be equally competent to manage other companies. As stated in the study, there is no longer any 'divine right' for an actuary to become chief executive of a life company, but, equally, there is no reason that actuaries should not be considered in that role in other companies, where their particular expertise and understanding of risk and finance could add a new dimension to financial planning. I doubt if people moving in such circumstances, picking up a point the opener made, would necessarily stop paying their subscriptions. I think that they would still be proud of being actuaries.

Clearly, this is the purpose of the wider fields initiative, which aims to create a clear demand in industrial and other companies for specific actuarial skills, and this is important. However, unless actuaries see this as a stepping stone to another career, they will be much less likely to try such a move voluntarily, as they will be in danger of ending up trapped in a back room somewhere.

Considering the purpose of the wider fields approach further, I wonder what is the minimum number of actuaries required to ensure a thriving profession without diseconomies of scale making this impossible. I suggest that, in these days, where size appears to be an objective for survival, the profession could not support itself if restricted to, and thereby financed by, only those who actively practise their actuarial skills. This determination of a critical mass may be worthy of further consideration, as that might rule out any form of retrenchment or simply exporting specific actuarial skills to other companies without expectation of additional advancement. The latter could be achieved by providing consultancy services, which would certainly restrict the total number of actuaries required.

In this respect, I find Figure 3 alarming, as the dependency of the profession on core activities

leaves it very vulnerable to external influences such as regulatory changes, simpler products and the potential demise of the traditional with-profits contract. This makes the objective of successful diversification essential, and I suggest that that needs to become one of the higher priorities, if not the highest.

Mr A. K. Gupta, F.F.A.: The report projects continued healthy demand for actuarial services, with the number of actuarial jobs anticipated to grow in the next decade. I comment, not on the number of actuaries we will need in the future, but on the roles we see actuaries fulfilling — in other words, the quality of actuarial roles.

Actuarial roles have changed over the last decade, changes which have resulted from changes to life insurance companies and final-salary pension schemes. Over the last decade, I would contend that the power of traditional life insurance companies has reduced. Fiscal changes have tended to favour more transparent, lower cost forms of investment and have disadvantaged life insurance companies. Regulation has acted to increase the cost of life insurance through heavier compliance and lower sales productivity. At the same time, deregulation has encouraged the encroachment by other financial institutions into the savings and investments markets. Within the pension scheme arena, legislation has acted to increase the cost of final-salary pensions, and the introduction of a solvency standard will increase further the cost of final-salary pensions and encourage a move towards money-purchase pensions.

Whether these changes are all part of a planned political agenda is unclear, but they are consistent with the Government's desire to empower the individual at the expense of institutions through greater transparency and awareness of financial products. While a Labour Government might have a political desire to improve both state and employer support for the individual, demographic trends are such as to make such desires difficult, if not impractical, so these changes are unlikely to be reversed. As the power of institutions decreases and the demand for paternalistic products declines, the role of the actuary providing services to both institutions and customers must alter, especially in the areas of life insurance and final-salary pensions, which have traditionally been the twin bastions of the actuarial profession.

Traditional life insurance and final-salary pensions each requires significant actuarial judgement, if not discretion. The role of the actuary in both of these areas has been paternalistic, essentially that of a guardian. The job of the actuary has been to balance the interests of the consumer with those of the other interested parties, and to apply judgement to ensure that equity is achieved.

Increasing consumerism, better educated customers, and demands for greater transparency will reduce demand for this role. Already the financial leader of one reputable newspaper has described bonus recommendations as 'arcane actuarial alchemy'. In any event, I question the ability of actuaries to withstand intensifying commercial forces in fulfilling such roles.

We need to adapt the role of the actuary. At least three other alternative role models can be identified. I classify these as the technician, the compliance officer and the financial navigator. Many actuaries appear to take comfort from rules and guidance notes. However, I feel that over-dependence on rules and guidance could ultimately undermine the influence of the actuary. If we continue with the trend towards increasing numbers of rules and guidance notes, the actuary's role becomes, essentially, that of a technician. This is the case in many European countries, and, consequently, actuaries there have less influence and are perceived to be of less value than in the U.K. On the other hand, life insurance regulators would appear to want us to play the role of the compliance officer, and while we could undoubtedly fulfil this role successfully, it is a less creative role than our current role, and one that holds few attractions for me.

My preferred role is the financial navigator. This role makes most use of the actuary's ability to analyse, assimilate and interpret data, and, through such analysis, guide an organisation or individual towards the correct financial business result. This role is the one that I believe is likely to protect and increase the influence of the profession. In my experience, influence, at least in part, derives from the clarity with which one can define and articulate business imperatives. The actuary's skills leave him or her well placed to do this. It is for this role that we should be recruiting, training and encouraging actuaries.

The report recognises the problem of obsolescence, and I believe that this will be one of the greatest challenges facing the profession over the next decade. The report highlights that many actuaries are going to have to retrain in a different actuarial sphere at some time during their careers. To help counter this problem, we need to equip actuaries with greater generic actuarial skills and, perhaps, downplay the importance of detailed actuarial knowledge. We need to encourage actuaries to enhance their data analysis, assimilation and communication skills rather than ensure that every actuary is up to date with insurance valuation regulations when they qualify.

The report identifies a way forward. While CPD can undoubtedly play an important part, changes in the basic training are required. I believe that developing a tiered examination syllabus, in the way described in the report, is appropriate, if not essential. In summary, we need to produce a syllabus which requires less detailed knowledge, but greater generic actuarial skills. Actuaries who then choose to take on specific advanced roles, such as Appointed Actuary or Pension Scheme Actuary, then may need a more advanced qualification. It will mean that actuaries, on qualification, may not command such a premium for technical knowledge, but their value will be enhanced as they apply their skills and gain greater influence. At least, that way, their value will be derived from having greater influence in organisations, rather than from being people who merely apply rules and monitor that rules are not being broken. I believe that, in this way, we can increase the influence of the profession.

Ms A. C. Dash, F.I.A.: I work in the wider field and I was a member of the task force.

We all know the trends in the industry that are causing life companies and pensions consultancies to re-examine their strategies — in some cases quite radically. It is right that the same trends have prompted the Institute and the Faculty to start thinking about what changes are required in the profession and what the strategy of the profession should be. I think that there are three key questions now facing the profession:

(1) What do individual actuaries and students want from the profession? Is it a qualification that can be used as the basis for a very wide-ranging career or is it a 'cradle to grave' support through a fairly narrowly defined actuarial career? I believe that an increasing number of, mainly younger, actuaries are recognising that the letters FIA or FFA after their names forms only part of a skill-set, and they are quite happy to take personal responsibility for filling in the other skills that are needed. This differs from what I perceive to be the more traditional view that some actuaries have: that the one thing that he or she can offer an employer is that he or she is an actuary.

(2) What do employers of actuaries want from the Institute and the Faculty? Specifically, for which areas, if any, can employers rely on the profession to push, and, in these areas, should there be proof of actuarial added value from commercial success before the profession takes it up? Is there a case that, for some, maybe just one or two, well-defined areas, the profession should be doing more, can this only really be achieved if there is formal sponsorship by employers, so that real quality work can be carried out on a full-time basis? I suggest, as an example, that actuaries should be doing more in helping to find healthcare and pensions solutions for the ageing population. To give truly professional support, we need to have more than the traditional part-time working party.

(3) How much true actuarial work is carried out by actuaries? Why is this important? Imagine every actuary honestly filling out a time sheet, over a period, that recorded what proportion of time he or she was working on a problem that used core actuarial skills and really could not be done by a non-actuary. Imagine that the answer was 80%. Then there is a strong case for the profession to take a 'cradle to grave' support function, because, clearly, a number of actuaries need and use actuarial skills as they go through their career. Then, imagine if the answer were only 20%. That would suggest that the role of the profession should be that of an educator for a qualification for a very broad career base. The answer probably lies somewhere in between, and it is almost certainly segmented. Some actuaries are using their core actuarial skills 80% of the time; for others it is zero. Until we have a clear view on this — which requires a clearly defined definition of what the core actuarial skills are — we will not be really sure that the Institute and

the Faculty are taking an appropriate and clearly defined role in education versus on-going career support.

It is clear that, whether everyone agrees with the detail of the way we carried out the analysis, the most likely future for the profession is one where supply of actuaries exceeds demand. Naturally, in this situation the profession starts looking for other areas in which actuaries can work. Let us be realistic, the wider field is tough. There is much competition out there, and there is no case for an actuary to have guaranteed employment. We need to start with a rigorous self-assessment, and we need to be clear as to the objective of the profession. If we can answer my three key questions, we would be a step closer to what might be the appropriate model for the profession. Is it one where we are trying to increase the number of actuaries qualifying, no matter what they do after that, or is it one where we try to increase the amount of actuarial work done?

Dr A. S. Macdonald, F.F.A.: My comments relate to the implications for education, which is obviously one of the keys to the future of the profession. Where this report touches on education, I find that I agree with almost everything that it recommends. I was struck, however, by the extent to which it identifies aims which conflict strongly with the recent changes to our education system. If this report's approach to education were to be accepted, it would be necessary to reverse many of these changes. I would support such action.

I will confine myself to two points made in the report:

(1) the need for deep rather than surface learning (which some have suggested might not be unrelated to the problems in the pass rates in the examinations); and

(2) the need for greater facility in stochastic methods and financial economics and when I say 'stochastic methods', I wish to make it clear that I am talking about the area that Mr Gupta referred to as data assimilation and modelling.

In their 'Consultation Document on the Proposed New Syllabuses' (April 1991), the Education Strategy Working Party (ESWP) said of the earlier subjects: "The content of these earlier stages of the examinations should be effectively defined by what is required at the later stages. Material which does not serve that particular objective can in principle be dispensed with...". In other words, an actuary is defined by the nature of his or her area of practice, and the underlying mathematical skills should be confined to the minimum needed to access these practice areas. Such an approach will lead — and is leading — to three detrimental consequences:

(a) It dilutes the core mathematical skills of the profession, making it less likely that practitioners will be able to keep up with developments affecting their practice areas. The most glaring example is financial economics, compared with which the actuary's mathematics of finance is very naive. This is not a strong position from which to assert the need for actuarial involvement in new areas, or even to make critical comment if an actuarial viewpoint could add something useful. The working party is obviously aware of this, but it is by no means the only example.

(b) If the mathematics is seen just as a low hurdle to be jumped before reaching 'real' work, there is a strong disinclination to pursue deep learning, which comes to be regarded as an indulgence. Students often seem to pick up the message that any natural interest in mathematics should be set aside with their degree certificates.

(c) Perhaps, most important, the launching pad which we need if we are to penetrate new areas is not detailed knowledge of life offices and pension funds, but a high level of competence in a broad base of core skills, such as only deep learning can impart. These skills might include management skills, such as would be found in an MBA, as well as mathematical skills. An actuary's deep, but narrow, specialism should be the apex of a pyramid, resting on the solid base of core skills. The ESWP tried to build their pyramid upside down.

There was, and might still be, a case for trimming the syllabus, but to trim core skills in order to pack in detailed coverage of life offices and pension funds is like sawing off the branch upon which one sits. It also does nothing to reduce the over-emphasis on the minutiae of U.K. practice.

A further impediment to deep learning is the reliance on the syllabuses to link separate tuition and

examining arrangements. Such a system could be made to work if only the interests of the examiners and the tuition providers were the same, but, sadly, they are not. There is a risk that examiners feel obliged to interpret the syllabus narrowly, and then shallow learning is encouraged. Of course, it is human nature for students everywhere to prefer exam-passing strategies to learning strategies, and, when tuition is reduced to a commodity, the providers can hardly be blamed for trying to satisfy the wants of their consumers. It is not impossible that the profession will come under pressure to set its standards by reference to the level to which the tuition system is able, or willing, to prepare students. Explaining to students why this is inappropriate will call for particularly clear communication on the part of the profession. As members of the Board of Examiners, I and some of my colleagues, with whom I have discussed this, feel that the core reading is now the profession's 'thin red line'; it is all that stands between the profession and the final loss of control of standards.

I will now turn to the need, at or near the top of almost all of the lists of future skills given in the report, for greater emphasis on stochastic methods. Again, it is sobering to contrast this with the recent changes in the education system. The ESWP's plan took probability and statistics away from the start of the old syllabus, and sealed it off in Subject C. Far from being recognised as the very basis of actuarial mathematics, they were relegated to the substitute's bench, so to speak, to be brought on only for the last part of the game. Worse, and almost unbelievably, material already in the course on stochastic models, including some of importance in financial economics, was actually removed. Fortunately, some of it was reinstated, but the aim did seem to be to move away from, and even to reject, stochastic methods, rather than to give them greater emphasis. I am glad that this report takes the opposite view, and I am glad that this time the proposals are being put before a sessional meeting.

If we embrace stochastic methods and financial economics, then they must be covered in adequate depth. Actuaries cannot contribute to these areas, even to inject sensible and valuable actuarial views, without first mastering the tools that already exist. With this in mind, we must be realistic about the limitations of informal, post-qualifying study, such as the current CPD system. To leave genuine mathematical study to CPD would surely be ineffective. It has to be examined formally, whether it is studied before or after qualifying. If this means shifting some of the material currently in the later subjects to the CPD level, so be it. This might be useful on other grounds anyway, for example to allow the introduction of some management subjects. Perhaps it is time to consider a system of practising certificates in the main practice areas; it would also seem to be easier to extend our professional standards to new areas by means of new practising certificates than through the examination system.

In 1945, F.A.E. Crew, speaking to the Faculty, said: "I think it is fair to say that by the profession as a whole an ignorance of, and a scornful and distrustful attitude towards, statistics are regarded as the praiseworthy attributes of a robust personality". As it happened, he was referring to the medical profession; but substitute 'financial economics' for 'statistics' and he might have been describing certain parts of the actuarial profession. I hope that this report will be effective in turning actuaries around to face their uncertain future instead of their illustrious past.

Dr L. M. Pryor, F.I.A.: I should like to support what the previous speaker has said. I believe that what we have to think about is what makes actuaries different from other professions. We have to recognise that our core skills and our core areas of expertise are in the analysis and modelling of risk and uncertainty. That is what makes us different from the accountants, for example. To some extent, our profession has recognised this, or individuals in the profession have recognised this, as we have moved from our traditional areas of life and pensions to general insurance and healthcare. I believe that this is good, but not good enough. We should stop seeing ourselves as primarily insurance professionals and see ourselves as risk and uncertainty professionals.

We should build on these parts of our expertise to apply them in different fields. For example, I am currently investigating the application of the use of credibility theory in robotic control. This may be an extreme case, but there are almost certainly other possibilities. We should also look at different methods of analysing risk and uncertainty. Hitherto, we have primarily concentrated on quantitative analysis, and this has been enormously aided by recent increases in computer power, allowing us to

do analyses that we would not have thought possible 30 or 40 years ago, or even five years ago in some cases. In performing these analyses, we are limited by the availability of statistics and by our ability to come up with prior probabilities. We should also be investigating techniques of qualitatively analysing risk and uncertainty. In my own field of artificial intelligence, there is active research in these areas, and I believe that actuaries should be involved in coming up with applications of these techniques, and also in developing the mathematical foundations of these techniques.

Mr J. Goford, F.I.A.: I have some genuine concerns which have been echoed by the opener on how training and exams need to move together, and by Dr Macdonald on the control standards and core reading being the 'thin red line' of the profession.

Let me focus attention on the actuary as a product which the profession has a responsibility to produce. Let us think about the quality and the volume of the product that we are producing. These are not mutually exclusive. Quality is capable of many definitions. The quality I want to think about is the one at the standard qualification level, rather than standard plus. We have some genuine choices here, but, in making the choices, we must remember that more of A means less of B. We cannot put more into the exams in total than is already there. If we want to put more in, we have to take something out, and we would probably have to take out more than we put in.

Quality and standards must be maintained, with the right balance between the amount of knowledge and actuarial skills that we ask of our qualified actuary as against what I call understanding, application, judgement, problem-solving, communication, etc. As Mr Gupta said, the second category is important in maintaining our influence; actuarial qualifications that concentrate solely on knowledge and actuarial skills mean less influence.

Let me point you to ¶36.5.1. The words here are, when talking about the standard qualification, 'broad', 'understanding', 'principles', 'apply' and 'problems'. These words are definitely pointing in the direction of understanding, application and judgement being more important, at that level, than higher level skills and knowledge.

Moving on to the SQ Plus level, ¶36.5.1 talks about 'detailed' 'specific' 'higher level' and 'demands' of the sector. So, in this report we are suggesting that high level skills and knowledge should be left until after the standard qualification. If you think that this is dangerous, then we need to know, so that we can change direction if we think it is appropriate.

I suspect that the demands of the different sectors are different. Life assurance probably requires a balance between actuarial skills and knowledge on the one hand, and understanding, application and judgement on the other. The non-life people are telling us that they need skills and knowledge, and, at the moment, they are not that interested in understanding, application and judgement. I overstate deliberately. The pensions side is heavily skills and knowledge orientated, although quite an amount of application, understanding and judgement is needed. Wider fields is again a mixture.

When you are thinking about the mixture, and helping the Education and CPD Board, can you also bear in mind that students can pass exams in skills and actuarial concepts relatively easily, and that they do not currently pass exams in understanding, application and judgement very easily. That may be part of the tuition issue; it may be an employer issue; but, certainly, students have much more trouble in demonstrating understanding and judgement than skills and knowledge.

Mr B. J. Duffin, F.F.A.: The main theme of the report which came through to me was the concentration on statistical growth and membership, and I commend the authors for not mentioning the salary information or the earnings potential of actuaries. Perhaps there is an assumption that actuaries can only be good for the public, and the more actuaries we have the better. A different slant — and I acknowledge that it overlaps with some of the themes of the report — would have been to look at the needs of the public, and how actuaries and our skills might meet these needs. In this respect, wider fields, as a group of areas, is probably one of the most interesting.

Consider how the actuarial professional bodies, themselves, can assist in exploring wider fields, compared with the initiatives of individual actuaries and their firms. The professional bodies are concerned with the development of knowledge, with the expansion of training required to meet these needs, and also with the control of standards and with discipline, which has not been mentioned so

far. To do so effectively, the professional bodies depend on the sharing of expertise, and the results of research, by actuaries pioneering in these fields. I stress one concern; commercial pressures on actuaries working in these fields are forcing confidentiality to a greater extent than may be desirable compared with the duty to the profession. If we do not have the sharing of expertise and knowledge in these newer fields, they are not going to be an area of professional development. They would be an area for individual actuaries to practise in, but not an area in which the profession controls or sets standards.

The main recommendations of the report are in the training area. I would simply add to the stochastic debate by saying that I would not wish to interpret ¶13.1(2) as implying that the deterministic approach was to be eliminated altogether. By all means we should develop the stochastic approach and the other methods, but the death of the deterministic approach has been greatly overstated by those whose philosophy should not allow them to permit any such certainty!

I have some concerns about the stress given to report writing skills, if this implies a greater introduction of business skills. We need to be clear about the distinction between professional and business responsibilities. It is likely to be much more expensive for the profession to offer business training compared to third party providers.

Mr P. D. G. Tompkins, F.I.A.: I was much encouraged to hear Mr Duffin raise the subject of discipline. One of the fundamental aspects of the work of the task force was considering the nature of our profession, and Annex A sets out our considered opinion. It is very important that, when we think about some of the ideas in our report, we should have that at the back of our minds. There are two qualities which distinguish any profession. One is its knowledge, its education, the subject matter in which we train our new members and which we then continue to develop through our continuing professional development throughout our careers. The other — and this is extremely important — is the concept of discipline, in regulating our members and serving in the public in ensuring that they can understand what an actuary is.

We have prepared our work from the point of view of believing that actuaries and actuarial skills have something important to offer to the public. We write as actuaries, we think as actuaries, but, in our experience, we have found that we can add value in many business areas, apart from those purely related to life insurance, pensions, non-life insurance and those areas that we have developed particularly in our education system.

I speak as someone who works in a firm largely composed of non-actuaries. Time and time again I see the opportunities occurring where I and my colleagues can be working alongside other people, and working very effectively, in giving our kind of thinking to the processes that are going on, which is different from the thinking of others. I very much support the idea that we should be broadening the number of people who have actuarial education. I say education, and the question I want to throw at the profession is: are we educating people as members of the profession or as people who have had some actuarial education?

Mr Gupta spoke about the two-tier structure; a number of speakers have referred to it subsequently, where we might have a standard qualification which is, perhaps, our current idea of a diploma in actuarial techniques, perhaps something a little further developed. Having done that, would such people be subject to discipline? Would they be subject to the regulation which comes with being members of a profession? I am not sure that that is necessarily implied by the thinking which is saying that we ought to have people looking to go into business and serving the public as people with an actuarial approach.

I probably lament the passing of the Associateship, which the Institute had as a partial qualification a number of years ago. Something of its form is undoubtedly very useful in giving people the feeling, the satisfaction, that they have something under their belt — if you like, the letters to go after their name. The Privy Council has had some unease about partial qualification and use of letters in the last 25 or 30 years. In this area, it will be important to have very clear discussions with the Privy Council if we are thinking about change in the way in which we can serve the public, serve potential members, and give people credit for having learnt about the way of applying our techniques to the business world in general. It will be a challenge, not just for us, to put across our ideas to business,

but also to our potential new entrants. It will be very important for the Careers Committee and for those who are promoting the profession in higher education to encourage people, if we develop this route, to see the opportunities available to them to spend three or four years studying, reasonably confident that they will get some qualification and experience under their belt as part of their preparation for future business. We need to think through very carefully how we then expect those people to participate in the profession.

Mr C. W. McLean, F.F.A. (in a written contribution that was read to the meeting): I should like to offer some comments from the perspective of the minority of the profession working in investment and wider fields. I am more optimistic that many more openings for actuaries may emerge in this area. I work in an investment business that now employs two qualified actuaries within eight full-time staff. There are many more technical areas emerging within investment management in terms of more sophisticated financial instruments and increased need for risk controls. Increasingly, the disciplines required in investment, in terms of adherence to mandates and a specific style, need very numerate professionals. Quantitative investment work can similarly employ actuaries; and, looking at the demographics in Figure 8, most employers can recognise a bargain in terms of available supply. I think that this means that much of the current bulge of students at age 25 will, inevitably, find work further afield than their initial employers.

I agree with the report's emphasis on the need for greater training in modelling techniques, such as option pricing. Of course, in terms of stochastic modelling, it is important to remember that what is ideal for life office asset/liability planning may tell you very little about other fields of investment — particularly the interaction of investment returns with the objectives and risk perspectives of other investors. I believe that the profession needs to break away from its life office focus on liabilities in relation to modelling. There are already signs that the next few years will see the investment division of life offices promote themselves in wider markets, and actuarial disciplines should be brought to bear on the differing objectives of these new clients. I think that a tolerance for ambiguity, combined with strong communication skills, will ensure that actuaries retain their status as professionals, even in other areas. I think that the over-supply can become an evolutionary strategy which will push actuaries into new areas, which they can then proceed to handle well. I do not know what decrements were assumed in the model in Section 35, but, I suspect, that there will be many more early retirements — possibly to go on to do non-executive director work or other similar roles.

I note, in ¶23(7), that the profession is uncertain as to how to react to pressure from other professions. I think that it is unfortunate that this is viewed still in terms of a "challenge" to "the right of actuaries to be the sole operators" in certain areas. I would disagree with ¶37.1, where there is a suggestion that the profession must prove that it is 'uniquely' qualified to operate in the field concerned. I think we merely need to show that we are 'best' or 'well-qualified', and have a much greater toleration of ambiguity in working with other professions — we may not get clear demarcation lines in multi-disciplinary areas.

I do not think that the question of an investment actuary should be investigated further. It had always struck me that many very successful individuals in the broader financial sector — including stockbrokers and some leading financial analysts — began their careers as actuarial students. It is a pity that so many who gravitate towards the Stock Exchange, and often have successful careers, are viewed by the profession as simply 'failed actuarial students'. If actuarial training is to be a stepping stone to other careers, we need to adopt a more positive attitude. I agree, as mentioned in Annex E, ¶2.5, that the actuarial profession is now viewed as being a long way behind in some quantitative areas, but I do not think that that position should be accepted.

Mr M. J. Breingan, F.F.A.: Looking back to the situation in the Scottish offices 20 years ago (for example), it was normal to recruit actuarial students and assist in their training through a fairly long period of study, culminating (it was hoped) in their qualification. The office would also hope to have recruited a high calibre individual, and he or she could then, potentially, move into wider areas of management. So, students in those days had it 'both ways' — they possessed a prestigious qualification after a number of years of study, but also had access to the wider management pool

within the office. Times are changing — so that in ¶22.4 we see that "within the insurance world, actuaries occupy fewer of the senior management positions than they did a generation ago. The concept of companies being run by actuaries has seen a steady decline". Connect this with the comment, in ¶19.2, that "there is very little evidence of many actuaries straying far from the areas of work mentioned so far. Hence, in anticipating where the profession is going over the next 10 years, we have concentrated on the prospects in areas it presently serves and the opportunities which may develop to extend into adjacent areas. Large leaps cannot be discounted, but they should be viewed realistically".

Does this comment constitute a positive statement about the profession — because in previous years there has been a sufficient challenge for actuaries within the life and pensions arena; or does it reflect a natural conservatism and sad complacency within the profession? Looking at these trends, I suggest that we need to be changing the 'realistic expectations' of student recruits at present: that, perhaps, we now have to tell them that there is no guaranteed outlet to general management, and that actuaries should expect to play more of a specialist role in future.

I also outline a way in which we can, as a profession, make that 'quantum leap' into the wider fields to which we aspire. I suggest, while there are still some life office chief executives who are actuaries, that they lead their organisations to pursue some aggressive acquisitions of banks and building societies, and then force into their new subsidiaries a large number of actuaries!

Mr P. J. Nowell, F.I.A. (closing the discussion)**:** The opener made a series of points, but his key criticism was that we had not really addressed the fundamental question "What is an actuary"? Possible explanations why we did not try to answer this question are:

(1) we felt that the profession is itself and the people in it;
(2) we felt that the profession would, anyway, change in the directions required; and
(3) the Society of Actuaries had done a big study which addressed this issue.

Having said this, the task force will address this issue, at least to the extent of what is available and what else could be done.

The opener also mentioned demographic changes within the profession. One way in which the profession is gradually changing is in the male/female ratio. For present students the split is 61%/39%, whilst, for Fellows it is 88%/12%. In time, this should lead to an increasing percentage of female Fellows. It will also mean that the average female Fellow will be younger than her average male counterpart.

This is the first general debate on the report, and I am grateful for the opportunity that the Faculty has had to be able to present it. At the moment, I think that there seems general support for the idea that we should put more emphasis on modelling techniques. There also seems support for an approach based on a 'standard' and 'standard plus' qualification. This needs a lot more work, and I know that the Education and CPD Board has already begun preliminary discussion. I hope that, in anything we do, we take on board the importance of continuity in the education process.

I think that we have not brought out the international opportunity enough.

I also get feedback that we should not give up on investment and personal finance — instead we should increase the quality and quantity of our efforts.

The President (G. M. Murray, C.B.E., F.F.A.): Thank you all for your comments and opinions. The two Councils and the task force will consider them carefully, along with the other discussions, before reaching conclusions early in 1996. An edited report of this discussion and that to be held at the Institute will appear in the *British Actuarial Journal.*

We have had a valuable discussion this evening, and it only remains for me to express our thanks to all the task force for producing this comprehensive and thought-provoking study.

ABSTRACT OF THE DISCUSSION

HELD BY THE INSTITUTE OF ACTUARIES

Mr K. J. McKelvey, F.I.A. (opening the discussion): I am in the unusual position of being in the actuarial mainstream, and yet being very familiar with the type of strategic thinking that is reflected in the presentation which Mr Paul Coombes of McKinsey gave to the Council of the Institute in late 1994, because for seven years I worked in management consulting in the area of corporate strategy. If this gives rise to 'different' thinking, then I hope that this will be of value, and that any criticisms I make will be taken positively.

The report presented here is wide-ranging. In some 60 pages it develops 10-year projection scenarios for five separate major industries or sectors and two ancilliary sectors. Those scenarios are then used to construct a projection of the demand for, and supply of, actuaries. That projection and a great deal more thinking give rise to a set of proposals for future action. The authors have been careful to draw attention to areas which would bear further examination, and to make readers aware of critical assumptions, variation in which would significantly alter their conclusions.

The report is the latest step in the process of setting strategy within the Institute and the Faculty. It grew out of Mr Coombes' presentation in 1994. That, in turn, followed several prior initiatives, including the 'Strategy for the 1990s', presented in 1991 (*J.I.A.* **118**, 429). Having read that and several other prior papers, it is clear that the future of the profession, including how we should grow in numbers and widen our activities, has been under discussion at least since the early 1970s. In this report we see a healthy move in the direction of clear analysis and hard thinking, but I believe that several fundamental issues still remain to be addressed in the process of our wider strategic thinking. Some of my following remarks may appear to be a little theoretical. I would respond that, in my experience, developing a strategy is easy — developing one that will actually work is harder.

My first concern is that I do not understand what a strategy 'for the profession' is. This phrase is frequently used in much of the work we have done. Our profession operates in several very distinct sectors, as the report clearly shows. The businesses in which the members of the profession are involved each has a strategy relating to one or more of those sectors. Separately, the Institute and the Faculty, the Councils, officers, committees and staff of those bodies, need a strategy to assist and support those members.

However, I cannot see that the sum of these two distinct types of strategy is meaningful. Rather, the second is a function of the first. Therefore, I am not sure that there is such a thing as a strategy 'for the profession'. What does the 'Future of the Profession' mean? Are we talking about giving the Institute and the Faculty the clearest possible framework within which to do their job of supporting us, or are we talking about some grander vision of significantly changing how the future of all members of the profession will unfold? In fact, the 'Strategy for the 1990s' and the report we are now considering result in action plans for the Institute and the Faculty, and, therefore, follow the first of these two approaches. In my view, this is how it should be. Nevertheless, I think that it would be valuable to set down explicitly which aspects of the profession's future we believe that the profession, as a whole, can jointly and directly influence, and to concentrate our energies on those.

My second, and related, concern with the strategy work done to-date is that I can find no clear statement of our ultimate objective. The aim of this report is "to assist the U.K. actuarial profession to respond effectively to the challenges of the next 10 years", but what is the yardstick for measuring "to respond effectively"? The task force has been careful to make its recommended actions very clear. However, I can find no stated measure for the ultimate 'success' of our efforts in this or in any of the earlier work. I can sometimes infer a yardstick of 'full employment of all actuaries'. At other times it appears to be nearer to 'more actuaries is better'. The danger, as things stand, is that we will be able to tell ourselves that we are doing a good job of 'responding effectively' in almost any set of circumstances.

My final concern with our strategy process is that we have not done several of the things that Mr Coombes suggested:

(1) Coombes referred to the need to examine more carefully what an actuary actually does in a day, and in which areas 'actuarial skills' are essential. Our position is only ultimately secure in the essential areas, and we need to understand the dynamics of the changing balance of our work. Many of the actions proposed in the report arise from thinking along these lines, but these relate mainly to education and training. Are there not implications in other areas?

(2) At the centre of Coombes' logic were four possible options for how the profession might go forward. Two of those are noted in the report as having been classed as 'not recommended' by both Councils. I have already referred to a lack of a clear objective or yardstick. In the absence of an explicitly stated objective for our deliberations, it seems difficult to me to rule out a more complete analysis of these options. Did these fall into the 'unpalatable' category? In any event, of Coombes' four options, Councils have opted for a combination of 'soft encroachment' and 'relaxed self-confident permeation'. Even if Councils can control the relevant aspects of how the profession, as a whole, behaves, I believe that these terms, particularly the first, are not significantly different from how the profession would always have described its behaviour. It is, therefore, valid to consider how successful this approach has been in the past. The headcount of our profession has grown at some 3.5%p.a since 1970. The growth rates of solicitors and accountants are very similar. We could say that we have held our market share of the professional services market: neither a spectacular success nor a failure. However, during the same period, the management consulting sector saw growth at a far higher rate, more like 15%, depending on how it is measured. We were talking, as early as the 1970s, about expanding into wider fields, falling broadly under the management consulting heading. That expansion did not happen, even though circumstances were benign. I wonder if actuaries, on average, are simply not very good at 'soft encroachment' and 'relaxed self-confident permeation' in sectors where they do not feel naturally at home. If so, then, as even our 'natural' sectors get tougher, I have to wonder if 'soft encroachment' and 'relaxed self-confident permeation' are really going to deliver very much, either as an engine for growth or even as a mechanism for holding our position within our established sectors.

(3) Coombes wondered if it is possible to create a unique brand around our activities. Having doubled our numbers since the early 1970s, we now face partial unemployment in actuarial ranks. We are seen as an expensive resource in insurance, and fee pressure is intense in the consulting sectors. Coombes noted that our golden age is over, and that we are entering an age of uncertainty. When he talked about creating a brand, I assumed that he was talking about building a defence against these various pressures. The initiatives proposed in the report in the areas of education and training can assist in this area. The PR and promotional activities of the Institute and the Faculty can also help, but I believe that this notion is far from completely explored.

(4) Coombes introduced his final section by saying "the debate on future roles must begin with a realistic self-assessment". The report is an honest attempt to take a realistic view of the marketplaces we serve, and that is a good start to a process of realistic commercial self-assessment. However, as I have explained, it seems to me that several other fundamental issues remain to be addressed.

I turn now to some issues arising from the report.

As regards the life assurance sector, we could debate its future for hours. I might place a higher likelihood on the scenario of lower actuarial requirements than is reflected in ¶26.7.2. By analogy with what we were taught about property, in the main only three things will matter in life assurance: cost, cost and cost. Everything else comes back to this: organisation structure; distribution and sales strategy; product design; marketing and so on. As the report suggests, in such an atmosphere the focus would fall hard on expensive resources such as actuaries.

As regards the pensions area, I am glad to see an emphasis on innovation. It struck me, when I came back into this area, just how little the profession's techniques had changed in over 10 years, and

just how far they had fallen behind more advanced areas of financial analysis. There is a danger that the thinking has become too automatic. Clients eventually recognise this and react accordingly. This devalues all areas of our work. It is a characteristic of many successful businesses that, just when a product is breaking through to become successful and profitable, investment is at its highest to develop its successor. Maybe we need to bring that model higher up in our minds.

As regards employment levels in the pensions sector, the proportion of purely 'actuarial' work of my own firm is falling, and clients will no longer support the cost of an actuary doing work which does not need to be done by an actuary. The results are already apparent in our staffing structure — a higher proportion of pensions management qualified staff, a lower proportion of actuaries. On the other hand, there is a continuing flow of actuarial work arising from legislative change. On balance, I felt that the report painted a balanced picture of future numbers in pensions.

Under the wider fields heading, I remain concerned that the generalist skills, referred to in ¶31.5, and needed for working in the wider fields area, are not the natural skill set of the typical actuary. I am not sure that all of them can be taught if they are not innate.

The idea of a tiered education system, as proposed in ¶33.2.3, has some attractions, but, despite my own education and career path, I remain to be convinced why someone should choose an actuarial qualification at any level, over an ACA or MBA, as a route into a general financial or business career. Paragraph 36.4.2, in the report's final summary of implications for education and training, lists, fairly comprehensively, the skills which a first-tier training would have to provide if it were to serve as a financial generalist starting point. However, usually, with the exception of stochastic modelling, a finance-focused MBA course would address all of this, and is a qualification which is already widely recognised.

In several places there is reference to risk and finance, the treatment of risk and so on. We have fallen *very* far behind the leading edge in our treatment of risk. The development of stochastic modelling is a good and powerful initiative, and I support the emphasis placed on this technique. We certainly need to increase our understanding of financial economics and of recent techniques for analysing risk in financial areas, as the task force suggests. I know that some actuaries have significant technical concerns with some of the foundations of financial economics, but progress is generally made by absorbing, and then improving, existing knowledge, not by ignoring it.

I agree with the list of general business skills in ¶36.4.3, which we all need to develop better if we are to survive in the 'modern world'. Typically, actuaries are good with numbers, but not good with people. This is an increasingly critical and potentially fatal flaw.

Finally, to bring us all back to safe ground, what about the numbers? Are the projections of demand and supply for actuaries robust? It seems to me that they form a realistic basis for planning. To spend more time would not materially change their implications, and it is those implications on which we should focus.

Mr M. R. Kipling, F.I.A.: My company, a composite insurer, has had, for a number of years, a significant number of its actuaries, particularly the more senior ones, working in life assurance jobs that do not require an actuarial background. Rather, the actuary concerned was simply the best person for the job at the time. This is a fairly common situation. More recently, with the closer functioning of our life and general operations, some of those managers have progressed to management roles on the general business side.

Our general insurance operation is also eager to take on younger actuaries in a number of areas to carry out more technical roles. In time they, too, may be suitable persons for non-technical vacancies. Thus, I cannot see why, eventually, the general insurance industry cannot provide as many employment opportunities for actuaries as the life assurance industry does today.

The main point which I wish to make relates to education and training. I endorse fully the paper's concerns about our current approach, and I believe that it is increasingly too general. Annex E shows all too clearly how our influence in the investment field has declined. 'Rocket scientists' do not need to know about net premium valuations. United Kingdom life actuaries are increasingly challenged by other professionals. Accountants, in particular, seem to know more about our valuations these days than we do about their accounts — and they are also making tax increasingly their own. And what

are we teaching potential life office actuaries to do? We are teaching them to value final salary pension schemes.

In the light of these concerns, I wholeheartedly support the paper's proposals for an education system which provides a broad base of technical skills applicable to all areas, together with a second tier which offers choice — the choice to study only one or two chosen subjects in depth, and to study more widely at a lower level.

One approach, which would allow this flexibility, would be a modular one, similar to that normally adopted by universities. There would be some compulsory modules, covering the basic technical skills and the actuarial control cycle. These could, usefully, have a greater mathematical content than the current subjects A to D, to ensure that actuaries possess the necessary skills to compete in the 21st century — as many continental actuaries already do. Then there would be a wide range of voluntary modules and half-modules covering the current subjects E to H, together with much more: capital projects; healthcare; financial mathematics; management skills; marketing. The possibilities are almost endless.

I also suggest that it should be possible for some of the modules to be examined by outside agencies, for example the universities or other professional bodies, subject, of course, to appropriate accreditation. Also, to prevent someone qualifying as an FIA without having studied any of the 'great four' disciplines in depth, there could be a requirement to study a minimum number of 'core' modules, either one or two of the four. The modular approach will also be useful for CPD, especially if more career direction changes are expected in the future.

This modular approach would also deal well with the increasing internationalism of our education system. Any topic could be split into two parts, one which covered the subject without reference to any specific legislative environment (although maybe with case studies from several); and one or more which filled in, to a greater depth than is now possible, on the peculiarities of particular countries.

What about Subject Q, the Fellowship paper? I feel that its communication part can be tested at an earlier stage in the examinations, and that its 'application of knowledge' part can be incorporated into the core modules to which I have referred.

One final advantage of the modular system is that it allows the syllabus to be revised progressively, rather than the current approach of one big upheaval every decade or so. As a member of the Education and CPD Board, I will be attempting to persuade my colleagues of the need for radical change in our education system in time to begin to educate the actuaries of 2005. If we do not, there may be no future for the profession.

Dr L. W. G. Tutt, F.F.A.: It is stated in the report, in ¶37.2, that "it is the last resort of any profession to rely on statutory requirements". However, surely it may be added, that statutory duties are an integral part of a profession, and it would seem desirable for the actuarial profession, in its own interests, at least to make some effort, with justification, to cling on to its statutory duties for as long as it possibly can.

Currently these are in the spheres of life assurance and pensions, in neither of which, the report tells us, in ¶22.1, can the profession any longer claim a monopoly. Thus, with the honest self analysis which the report regards to be so desirable, it seems to be the case that other British bodies may be examining, in life assurance and pensions, in broader scope and, arguably, with greater penetration of subject matter, than the British actuarial bodies now do jointly. This hardly conforms with the assertion, in ¶37.2, that competition must be met. Nor does it augur well for the future.

It could be felt that, in overall interests, a profession is entitled to maintain its statutory responsibilities only if it can genuinely justify a claim to them; and that its holding of sub-standard examinations, both in absolute terms, and relative to others, does not entirely fit in with that criterion.

The report states, in ¶37.1, that, to hold its position, the profession must be uniquely qualified to operate in the field concerned. The actuarial profession does not currently meet that requirement in the realm of general insurance, as I can testify. My involvement in the general insurance sphere arises because of clients especially wanting consultation with a professional statistician. We are also told, in

Annex E, ¶2.5, that, in some important operational spheres in finance and investment, actuaries, in general, do not now even command respect.

Reference is made in the report to even wider fields; it being added, in ¶31.7.4, that the driving force behind the move to them is primarily that of unemployment. Surely all this is not good enough, and the profession just cannot continue any longer to ramble through the countryside peering down expanding funnels of doubt. Such an outlook, and all the fallacious writings associated with it, need to be completely discarded. Our younger members are so much more worthy of a positive, dynamic, outward-looking professional environment.

Moreover, we recruit into the profession students of high calibre, many of whom have received particularly good basic training from universities such as Heriot-Watt, City University and elsewhere. After qualification, excellent practical experience is gained from, for example, the eminent firms of consulting actuaries. It is the vital bit in between — namely the training for, and examination of, our students in the later subjects — where the profession is now losing so much ground.

Under the latest revisions, the fundamental techniques acquired in the early subjects are not being properly carried through, and there is a woeful lack of cohesion. Such need rectification.

This report is quite invaluable, for it contains many home truths; and home truths, as all know, are made constructively, being inspired by deep affection.

Mr S. A. Carne, F.I.A.: The report brings us to a crucial stage of the profession's strategic development. There is a need to make the right decisions at this juncture. The report provides a framework, but there is a danger that it will create confusion. Mr Coombes' definition of hard encroachment was: "...staking out claims to new territory where the actuary can exercise exclusive authority, supported by regulation". There was nothing about aggression in that definition, but the word 'aggression' does appear in the report's definition of hard encroachment.

It seems that, as originally intended, hard encroachment focused on an objective, whereas soft encroachment was about style. Those two options are not mutually exclusive, but, by presenting them to the Councils as though they were, Mr Coombes made a fundamental mistake. The authors of this report, by treating soft encroachment as the obvious way to go — so obvious that it is stated, in Section 3, without any analysis of the reasons — have not simply chosen a style, but have apparently thrown out the objective behind hard encroachment.

The report observes that other professions are encroaching on actuarial territory. However, if potential actuaries join other professions, new entrants joining the actuarial profession will tend to be those with a desire to pursue core actuarial activities. That is retrenchment by default. If the soft encroachers and the self-confident permeaters join other professions, there will not be any actuaries to do any soft encroaching for us. I suggest that the chosen strategy of soft encroachment and self-confident permeation necessarily means competing with other professions to win the graduate entrants.

Curiously, the report estimates that there will be only 100 wider fields actuaries in a profession of 4,000 in the years to come. I ask myself: how can such a tiny proportion be consistent with the stated strategy? If the number of actuaries in the wider fields do not exceed the tiny number predicted, then, by definition, the strategy will not have succeeded.

The report sets the profession on the right track, but there are too many pitfalls that have not been spotted. Careful thought is needed if the profession is to achieve the stated objectives.

Professor S. Haberman, F.I.A.: There is no mention of research in the report, which is both surprising and disappointing, given that the document is studying 'The Future of the Profession'. It may be worth noting that, 100 years ago, such myopia was not exhibited by those who framed the objectives of this Institute, as included in the Royal Charter of Incorporation of 1884.

I can be more positive on education. Here I find that I agree with the general thrust of the report, and its identification of technical skills in stochastic modelling and financial economics as being of particular importance for the actuaries of the future. The recommendations on education will require a further fundamental review of the whole education process for actuaries, and this is a step that I would strongly support; so why should we have to go through this upheaval so soon after the last review?

Let us consider the fundamental core technical skills and competencies needed of a qualified actuary in order that he or she may be an effective actuary and can move effectively and with confidence into 'wider fields'. These might include stochastic modelling, asset/liability modelling, financial economics and option pricing, mortality/morbidity multiple state models, simulation and so on.

There seem to be several different approaches to the educational provision for these skills and competencies, and three different options:

Option 1. We can take the view that it is not necessary for the actuary to know the details of these methods or models. The skills required effectively involve other cognate disciplines like statistics or economics, and are not the province of the actuary. Thus, these topics should be left to such other specialists, and the actuarial syllabus can be trimmed back.

Option 2. Actuarial education (for the initial professional qualification) should focus just on basic statistics and economics. Actuarial examinations should be devoted to practical problems of current importance, and anyone with the FIA/FFA designation should be an expert in some branch of actuarial practice. More advanced techniques should be left to informed CPD.

Option 3. In contrast to option 2, actuarial education should cover the technical foundations of the subject in depth. Instead, it is the details of U.K. legislation and regulation that can be moved into the realms of CPD and practising certificates.

Option 1 would, of course, be disastrous for the profession, and would lead to more adverse consequences than retrenchment, to use Mr Coombes' nomenclature.

I would argue that the last revision of the U.K. system of professional education has led us very close to option 2, and is having a number of consequences that are, in my view, disastrous:

(1) There is a dilution of the core skills of the actuarial profession. Without a firm foundation, it is unlikely that practitioners will be able to understand the implications of technical developments in actuarial and related fields that impinge on our practice areas. For example, our belief that financial mathematics is synonymous with the theory of compound interest is rather naive, and has led to many actuaries having to catch up on, say, option pricing from a negligible, if not weak, basis.

(2) There is much debate in the profession about the failure of the education process to promote deep learning, something that the Board of Examiners is aiming to test. It becomes difficult to promote deep learning when the foundations of the subject are presented in a cursory and non-rigorous manner.

(3) The abandonment of textbooks as flagships of the profession's area of competence has contributed to this decline. The danger is that we progress on a 'slippery slope' of indicating to students that it would be in their best interests to memorise lists, use mnemonics and other tactics in order to pass examinations and attain professional qualifications. Students are no longer exposed to interpreting a cogent argument, no longer required to read textbooks or Institute and Faculty papers and try to understand their supporting discussions. It is only the recent introduction of core reading that is preventing the descent into educational oblivion. A further advantage of textbooks is the manner in which they can be used to demonstrate and reinforce a profession's area of expertise (to the outside world) as well as to advance it. In this context, we should note that the Society of Actuaries has, itself, commissioned works on the applications of fuzzy set theory, option pricing and risk theory to actuarial problems, as part of its strategic moves into wider fields.

(4) These factors will make strategic moves outside of our current areas of expertise, following the avenues of either 'soft encroachment' or 'relaxed, self-confident permeation' difficult. Further, I would argue that other potential practice areas will be impressed by our profession's core skills, not by our familiarity with legislation and regulation and not, necessarily, by our 'self confidence'.

So, I believe that this report on 'The Future of the Profession' has given us the opportunity to revisit

our education system at both the qualification and the CPD stages. This system, in my view, should be reconstructed with a solid base of core technical skills, with practice specialisms at the apex, as Mr Kipling has suggested.

As part of this review, I believe that we should look, not just at the syllabus, but also at the system itself. Do we currently have a system where all the participants have similar interests? The Board of Examiners is charged with maintaining standards and examining at an appropriate depth, indeed they are keen to promote deep learning, but are the tuition providers, the students and their employers (who are effectively paying for the system) working with the same objectives in mind? Is it not likely that there will be pressure on the Board of Examiners to interpret syllabus objectives in a narrow manner so that surface learning is encouraged, pass rates increase and everyone is happy — in the short term?

It is noteworthy that the Australian Institute of Actuaries and the Society of Actuaries in the United States of America are both at different stages of reviewing their education syllabuses. Both revisions are moving in the directions that I have described, and both share another interesting feature; they see an important and growing place for universities in the professional education system, at both the initial and CPD levels. I believe that there are lessons that we can learn here — in particular, resources invested in universities pay off in many beneficial ways, not least in terms of applied and fundamental research.

To sum up, I believe that we should revise our education system along the lines that I have set out as option 3, thereby following the lead set by our colleagues in Australia and the U.S.A. The essence of actuarial work is the evaluation and management of risk. The core tool is mathematical modelling. Abandoning these roots will lead to abandoning actuarial science in the long term, although, perhaps, not actuarial practice in the short term. It is the science that underpins the practice, and we must think long term about our own future.

Mr N. S. Spencer, F.I.A.: I would like to ask, what is the profession, what is its purpose and what are its objectives?

I do not think that we can offer someone the same sort of business career type option as the accountants do. What actuaries have to offer is something different. What I think is unique about us is our analysis of long-term risk. That is what is common across the disciplines, and I agree that it is not being addressed in the exams at the moment. We have to see that we are building on our ability to manage long-term risk.

I would say that the examinations are now in crisis. I have recently qualified, and, out of the last six examinations that I took, four of them had a 25% pass rate. That is too low. It is not a reflection on what the examiners were trying to achieve; it is not a reflection of what the tutors were trying to achieve; it is a reflection of the fact that they were not trying to achieve the same thing. We were just caught in the middle.

One of the things that comes from the report and which must be implemented, as an emergency measure, is that we have to go to a modular structure. We have to look at specialisms. That will enable us to cover the depth that is required without it burdening the students with too much requirement on content. Alternatively, you could turn a four to seven year exam process into a seven to ten year exam process. That would be one way to sort out your numbers!

Mr D. J. Parsons, F.I.A.: One of the first actuarial exams that we took was on probability. The probability course told us that we lived in a world where variance was king, but also told us about averages and medians. Most of us have forgotten the detail and just work using averages, but it is the ability to deal with variance which is fundamental to what makes an actuary different.

I am sure that none of you will be surprised by some statistics that I have for you. Looking at month-end data over the past 67 years, the average gross real (that is by reference to prices) return over an exact 20-year period on an investment in the Equity Index, with all income reinvested and no expenses, has been 6.4% p.a., but does 6.4% represent what an individual investor's return should be benchmarked against? This is where variation comes in. The following table shows that the distribution is slightly skew.

Percentile	Average gross real return % p.a.
Highest	13.5
90	9.1
80	8.1
70	7.2
60	6.2
50	5.3
40	4.6
30	4.0
20	3.5
10	2.9
Lowest	0.4

The median is 5.3% which is quite a bit lower than the average of 6.4%, which is close to the 62nd percentile. The table also shows that the lowest gross real return was only 0.4% p.a., and remember that this was over a 20-year period. It also shows that one-tenth of the returns were below 2.9% and another tenth were above 9.1%. We get this variability just in returns on the index, and if we were to look at pooled unitised investments the effect would be compounded. I know that the future will not be the same as the past, but I am almost certain that the variance will not change a lot.

We actuaries are at the forefront of the populist trend of advising individuals to put their money into unit-linked savings, the approach being marketed on the basis that these give the investor the maximum upside opportunity, with few and explicit expenses. Actuaries are trained gloom mongers, but where have I seen more comment on the downside than "Investment values can go down as well as up"? If we allowed individual investors to see the probability of the downside, then there would be many fewer unit-linked contracts sold. Downside probabilities can easily be calculated stochastically, whether for an individual or for a company, but not from antiquated sensitivity tests. I imagine that the Government Actuary used stochastic tests when he was formulating rates for income withdrawals and age-related rebates. The results for an individual on these are quite illuminating, and quite disturbing.

These projections are most used by general insurance and investment actuaries as a management tool. Management reaction in the life and pensions industry has been to try to limit risk by changes in investment strategy, by the use of derivatives and so on, but also to accelerate the trend away from pooled risk, which is a fundamental principle of insurance. There was a time when insurance companies and pension funds existed to take the risk away from the individual. They did this on the principle of pooling, both of mortality risk and also of investment risk. They took advantage of the idea of pound cost averaging, both for incoming and outgoing funds, and effectively smoothed the return available to the investor, whether an individual or a company pension scheme.

Many with-profits funds and defined benefit pension schemes are now opting out, transferring the risks that they have traditionally borne to the individual. The individual risks transferred are dramatically greater than the pooled risks that used to be carried. I wonder whether building societies and banks appreciate the risk of lending money against the low level security of unit-linked endowments, personal pension policies or PEPs? The lending is likely to be based on the misplaced hope that everyone will get at least 'average' returns. There could be another mis-selling scandal here. I do not think that individuals ought to be expected to stand for it, but the only people who can tell them exactly what the risks are are us, the actuaries.

We must consider the resurrection of the pooling principle of insurance very seriously in our plans for the future. We must also consider the resurrection of defined benefit products in both life and pensions. They are still around in the non-life area. I am not saying bring back dinosaurs. We can devise new concepts, new techniques. Without them we could well follow the dinosaurs.

Mr D. H. Craighead, F.I.A.: Since I entered the profession, over 40 years ago, there have been

https://doi.org/10.1017/S1357321700003457 Published online by Cambridge University Press

enormous changes. The methods, the ideas, the concepts of actuaries have developed very greatly, and I think that we should look back on this and be thankful. I was very interested in what Professor Haberman said. I agree with very much of it, but I think that we ought not to be pessimistic.

I have had the pleasure of having developed into a new field and watched that field grow, burgeoning immensely. From that experience, I should like to make more specific suggestions than have been made so far, and to make a special plea for actuaries to become underwriters in the London reinsurance market. There is a very substantial field in that area, and it is wide open. Unless we move into it within the next few years, it will develop its own professional expertise in the same way as investment experts have done.

Not every actuary would make a good underwriter, but many would. There is no doubt that our training and expertise is highly suited to the role of the underwriter. There are currently two actuaries, both Associates of the Institute, who are pre-eminent in their areas, both being market leaders in their two different fields, both writing types of business that involve high risk and precise judgement. Neither was involved in the heavy losses that have battered Lloyd's in recent years, although both were directly in the line of fire. I would go so far as to say that, had actuaries dominated the field, the high losses that arose from catastrophes during the period 1987 to 1992 would not have resulted in the devastation that we have seen in the market.

One of the underwriters who has been responsible for the Lloyd's débâcle has actually stated, in his defence document, that the rate on line quoted for higher layer reinsurance had dropped so far that he considered it was extremely unlikely that a catastrophe would hit that layer, even via spiral type business, that, therefore, he was justified in writing business considerably in excess of his protection reinsurance levels, and that, in any case, if losses should occur, they would be recovered out of higher rate on line premiums obtainable in subsequent years. I cannot imagine any actuary arguing in that fashion. It does not require much acumen to anticipate what actually happened. Yet this man was regarded as a senior underwriter with a large number of Names, and was representative of the general attitude of underwriters at the time.

However, underwriting is an expertise that must be learnt by experience, above and beyond the mathematical training that we would bring to the task. There are very competent underwriters in the market, and we shall have to learn from them. It would require students to obtain employment as learner underwriters; preferably senior students already moving towards full qualification. Initially they would have to be prepared to accept a salary lower than those obtainable in current actuarial practice, but, if successful, would ultimately command a very substantial income. It is a strength in our members, both students and Fellows, that average incomes within the profession are as high as they are, but it is a weakness in trying to move into other fields.

Had Barings Bank employed the services of an experienced actuary, and had the bank placed him or her in a position of sufficient seniority to lay down the rules of engagement for the investment managers, both in London and abroad, the débâcle occasioned by Nick Leeson would not have occurred, and the bank would still be solvent.

I wonder, in that regard, whether the guidance rules laid down by the Bank of England, and recently extended, have, even yet, the safeguards within them that are essential to the task. I understand that they were based on guidelines derived from the concepts of risk-based capital. If they have not been extended beyond that, then they are still inadequate. They should be based on the adequate control of exposure, as I hope any actuary would advise.

Dr G. D. Kaye, F.I.A.: I feel that actuaries are their own worst enemies. It is in our training to be conservative. Unfortunately, many of us have taken that to mean pessimistic. If one speaks to potential employers and personnel departments, one realises just how wonderful we are.

I have recently found that employers are no longer looking to take on just one actuary, but two or three. I would like to pass on a thought that was given to me by one particular employer. He said that actuaries are an addiction — try one, and you want more. If we have confidence, then our future will be secure.

Mr J. Goford, F.I.A.: As Deputy Chairman of the Education and CPD Board, I should like to

concentrate on education. To start at the right place, I should like to speak about education in the context of the qualified actuary and the benefits that he or she brings to clients in terms of quality of advice, and, also, in terms of the volume of actuaries that the profession creates. I think that, by the careful setting of levels and qualifications, we can achieve both a higher volume of valuable actuaries, identifiable as providing specific, mainly technical, benefits to clients, and we can also produce more highly qualified and specifically identified actuaries, whose judgement and understanding have been tested, and who will also have demonstrated deep expertise in at least one speciality.

The major concept that we have wrestled with in considering the implications of this paper, and also in observing the training and examination of our current students, is the very noticeable difference between, on the one hand, knowledge, skills and concepts, and, on the other hand, understanding, application, judgement, problem solving and communication. We find that knowledge, skills and concepts are more important to certain branches of our profession than to others, and that students can fairly readily assimilate and pass examinations based on the testing of knowledge, skills and concepts. The other attributes: understanding, application, judgement, problem solving and communication, are more important to other areas of the profession, and seem to be the areas where students fall down in demonstrating these attributes. We believe, however, that the demonstration of these latter attributes is vital to clients, and is also vital for the extension of the influence of the profession.

In trying to design a revised examination syllabus, any proposals to put in new parts to the course must be accompanied by a proposal to take something else out.

As a broad generality, the profession's life specialism requires a good mix of knowledge and skills on the one hand, and understanding and judgement on the other. The pensions specialism seems to require an extremely heavy knowledge and skills base, a little less on understanding and judgement, but rather more on communication and, specifically, to a different audience. The general insurance speciality requires a very heavy demonstration of knowledge and skills, and is currently building its demonstrations of understanding and judgement. The investment and wider fields sides require their own different mixes. We have to bear these differences in mind in re-designing an examination syllabus. We have to remember that the attainment of these attributes by our students and our embryo actuaries is the responsibility of all five parties to the education exercise: students, employers, examiners, tuition providers and the profession itself.

The shape of the examination syllabus which seems to emerge from these thoughts is to adapt the first part of the examinations to be more rigorous and brought very much up to date, concentrating on knowledge, skills and concepts. There is no reason why such an early qualification should not be recognised as a very valuable building block for financial management. It would include practical key skills and concepts.

This could be followed by a set of examinations designed to test application and problem solving, but done very much in the context of the four main specialisms of the profession — investments, life insurance, general insurance and pensions. This objective would be achieved by concentrating, not on the detailed knowledge surrounding these specialisms, but the generic applications underlying them. They could each have a common theme, covering derivation of assumptions, modelling, monitoring of results, updating of models and communication.

Fellowship could be obtained with one, or maybe two, additional specialisms studied in great depth to demonstrate understanding, judgement and communication.

Mr A. D. Smith: As an experienced student, I am comforted that the profession finds my high examination failure rate a concern. An even greater concern should be the rate of non-entry. For me, an FIA is no longer sufficient motivation for taking the exams, since, even if I should succeed, the resulting career enhancement does not justify the time investment. More importantly, I believe that the work that I have produced since giving up the exams is of far more use to the profession than my taking the exams would have been.

How many actuaries, currently, are familiar with the skills of the future identified in ¶36.4.2? Not many, and the exams are not creating any more. We will need an extraordinary revolution if the techniques that we currently employ are to be replaced by the new list. I have spent the last five years

working predominantly in these new areas, and cannot pass the exams. Why can they not put the useful stuff for the future in the syllabus and have a bonfire of all the old rubbish?

The answer, I fear, is that, by unleashing talented and well trained actuaries onto an overcrowded market, current Fellows may be making a rod for their own backs.

Why are we threatened by the encroachment of other groups, accountants and rocket scientists, into actuarial grounds? In Sidney Benjamin's old files there are some letters from the 1970s explaining why actuarial students had to be used for programming, because programmers were so expensive. Now it is the other way round, and the main reason why we lose ground is substitution by more competitive providers. Continued erosion is a result, primarily, of our price positioning as a premium product. If others can deliver a better product at a cheaper price, then everybody gains except the actuarial cartel. We should not subscribe to a fortress mentality to defend our existing practices and current prices, because the result is a shrinking client base.

While those near to retirement may obtain good cash flow, the rest of us suffer if our business is put into long-term run-off. We have to invest to learn the new techniques, and give better value for money than the competition, even if they are non-actuaries.

Mr M. Shelley, F.I.A.: I agree with everything that is in the report about education. I was a member of the last review group that brought in the recent changes. Although we are all very disappointed with the way the results are coming through, particularly in terms of the pass rates, the last review group achieved some successes, including the joining of the Institute and the Faculty together in a common set of examinations. I have a great sympathy with all the candidates and with the examiners. At the moment both have been set impossible jobs to do. May I suggest to Mr Goford that he starts developing his proposals before it is too late for the current generation of students.

Mr J. M. Pemberton, F.I.A.: There are a number of references in the report to financial economics, and I believe that the relationship between actuarial science and financial economics is crucial. Whereas there seems a considerable enthusiasm on the part of many members to embrace financial economics, I want to urge caution. It has been described as a dismal science. Dismal it certainly is, but, in many aspects, especially the mathematical ones, it is not a science. It is not clear whether prediction is, or is not, an objective of financial economics, but, most importantly, it has no tradition of empiricism, and no tradition of checking claims against the facts. Actuaries, by contrast, must give practical guidance. They must address practical issues and they must focus on what *can* be predicted.

I have no doubt that financial economics will continue, increasingly, to fall into disrepute over the coming years. That is quite right — in its current form it is dangerous.

A key to the future of this profession, I believe, is to draw a clear distinction between actuarial science and financial economics. I do not want to ignore financial economics at all, but, by contrast, I want to study it actively, so that we can understand its flaws.

I believe that we have a great opportunity as a profession. As financial economics recedes, I believe that the techniques of actuarial science (which are sound) will be drawn into filling the vacuum that is left. This gives us the opportunity to raise the profile and the status of this profession in a very important and fundamental way.

Mr W. S. Rugland: As a President, in recent years, of the Society of Actuaries, I should like to assure you that this discussion is not unique to the United Kingdom.

It is my observation that many times we mix up vocation with profession. Profession gives us a set of skills; a vocation is what we do with those skills every day. If the profession thinks that it needs to deal with vocation, it loses track of what its mission is — and that is to continue to up-date our skills for use in whatever area we, as individuals, may wish to apply them.

We have had, as I say, endless discussions in the Society of Actuaries' leadership, as well as among the membership, for perhaps a decade and a half. Many of you have read the reports. Some of you have seen the report of the Institute of Actuaries' Committee, led by one of your members, trying to address the future role of the actuary. I thank Professor Haberman for listing the activity of the

Society of Actuaries with respect to this issue. The problem is that, when you have 16,000 members, it takes a long time for positive actions to filter through to day-to-day appreciation.

We continually strive to put those projects into a format that can be of value to our members. We have undertaken sophisticated membership surveys in the Society of Actuaries, trying to determine a level of satisfaction of the members with the profession and with their vocation. Usually they come out very positive. However, there are people who are expressing concerns, and that is happening more and more.

We have worked to address that. One issue that I want to address is what is the role of organisation within the profession as it deals with the future? The dilemma we found, in the Society of Actuaries, was that the organisation's governing body could not think about the future. It has to deal with what the members need today. With that in mind, we established a Society of Actuaries Foundation to deal with the future. It is funded with voluntary contributions from members and from other interested groups. The governance of that Foundation is outside of the Governors or the Council of the Society of Actuaries, and has met to think about things that would not be thought about by the governance of the Society of Actuaries.

So far we think it is working and well received. The major contribution from the Foundation will be at the end of this year, with a book on financial mathematics. We think that financial economics intersects with actuarial science somewhere, and we call it financial mathematics.

Mr C. G. Lewin, F.I.A.: The profession can now move in a very positive direction. The reason for this is that we actually have some new products to offer as a profession. Reinsurance has been mentioned earlier. There are healthcare products, and the one that I am particularly interested in — capital projects, especially as I am Chairman of the Capital Projects Committee. It is a vibrant new product for the profession. The reason I say that is that there are all kinds of signs reaching us that there is a market out there, and a market which needs us.

The CBI survey, a couple of years ago, showed that only about one quarter of manufacturing companies used quantified risk analysis when appraising projects. There is great potential there. More recently, the Private Finance Initiative is gathering momentum. It is said that it is going to be more important in the 1990s than privatisation was in the 1980s. The fundamental difficulty that they have come up against is what is the value of transfer of risk from public to private sector? Mr Douglas Hogg, the Chief Executive of the Private Finance Panel, and now at the Treasury, came to the profession and asked if we could help them. I leave that thought with you. People need us out there, despite all the management consultants, and so on. They need us; they need our professionalism. It is up to us now to show that we can deliver those services in an acceptable way that meets the needs of the marketplace.

Mr J. Plymen, F.I.A.: I want to comment on the investment actuary, as discussed in Annex E, Section 6. I disagree with most of what is said.

There is a comment on the syllabus in Annex E ¶9.1, "The present investment syllabus seems to fall uncomfortably between two stools, with a partial objective of training investment analysts, and insufficient attention to modern mathematical methods." I should like to say something about investment analysis. Most people think that it is just something that is done in the back office of a stockbroker, just a story written up to make you buy the shares. That is not investment analysis at all. I have been engaged on it for 36 years — three years in war-time operational research and 33 years as a stockbroker. During the war I was concerned with designing sights for guns and rockets. Then, in 1953, I started doing investment analysis, and the whole thing was familiar. In both cases you study the statistics, make up a model and go round talking to a lot of people. Then you put it together like a detective.

Studying investment analysis should include reading Sherlock Holmes. The detective element is most important. I maintain that investment analysis and operational research are the same. The actuarial profession is really the insurance section of the Operational Research Society. That is what it should be.

Real investment analysis is a tremendous job. Take a major company: you build up a model; work

out the earnings on capital employed; and see how the earnings are coming in and how they are ploughed back. Then you study the margins and competition — it is a tremendous detective study. When it is finished it is never published; it is too important. It is used in the high finance department of major companies, making takeover bids and planning new capital projects. Investment analysis is the basis for all company finance. The finance departments of major companies should be staffed with operational research/investment analysis experts, and these people should be actuaries.

I have found that 20% of the pages of the current investment course of reading are devoted to modern mathematical methods, and that investment analysis is not taught at all in the syllabus. However, investment analysis is perfectly easy to teach. All you have to do is to use the book *Security Analysis*, (5th Edition, 1988), by B. Graham & D. Dodd (McGraw Hill).

I suggest that we cut out the 20% of the course devoted to modern mathematical methods, most of which are phoney, because I have never found any of them achieve anything, and replace it with investment analysis. Then we will produce actuaries who have a real skill that is of great value for business, and with enormous scope for the profession in the future.

Mr P. F. Rains, F.I.A.: Investment has never been a core activity for actuaries, although it has always been an integral part of their education. Actuaries have, typically, gone into investment after working in some other area, such as life insurance or pensions. This has been a common experience, and, from the tables in the report and from other surveys, we can estimate that over 300 actuaries currently regard themselves as working mostly, or wholly, in the investment area, and about 250 of those are in the U.K. This number is not dissimilar from the number of actuaries working in general insurance.

The actuarial profession has, however, had a declining influence in investment, as other organisations such as the IIMR and the Securities Institute have provided the qualifications that those working in investment require, without the need to study pensions, life insurance and general insurance. This is a shame, as it appears that, now as much as at any other time, actuarial techniques and expertise have much to offer the investment world. A number of areas come to mind:

— performance calculation and attribution, including adjustments for risk;
— risk assessment for investment managers;
— the whole subject of quantitative investment techniques;
— assessment of credit risk for financial institutions; and, of course,
— the use of derivatives for investment funds.

These subjects are currently the province of financial economists, but no professional body expresses expertise in these areas at the current time. Unfortunately, neither is the actuarial profession competent, as yet, to express sound views about these subjects, and this will continue to be the case until the investment education syllabus covers them to the level required by potential employers.

The proportion of the actuarial exams currently devoted to investment is insufficient to provide the type of education needed to allow the profession to take advantage of the opportunities that lie in the investment field. This problem will not, in my opinion, be resolved by changing the investment syllabus. It is not possible to cover the investment topics required by pension, life and general insurance actuaries and also give the specialist investment training for those actuaries working wholly in investment.

The solution seems to be to allow a far greater level of specialisation in the investment field, and I support suggestions of that type in the report. That will reduce the requirement, for those who choose investment, to study other less relevant subjects. This may be heresy to some, but I think it is highly optimistic to believe that a professional education that devotes about a quarter of its syllabus to investment can meet the requirements of employers looking for senior investment professionals in the future. If greater specialisation occurs, then we can look forward to a significant growth and influence of the profession in the investment world. If not, it would be an opportunity missed.

Mr P. J. Nowell, F.I.A. (closing the discussion and replying)**:** The opener is right to point out that we have been no more or no less successful than other professions. It is quite interesting to see the

comparison with accountants and solicitors. When you consider the way in which the numbers of accountants are said to have grown, ours have grown at a similar rate. He also pointed out that we have lost out to management consultants, and probably to financial economists as well.

Where I disagree with the opener is when he says that we are not very good at soft encroachment or relaxed self-confident permeation. What we are not very good at doing is going into far off industries. Certainly, we have found it very difficult to find any real life examples of people who have done just that. At least 97% of us appear to work in traditional areas. I suppose that that, to some extent, fits with our slightly cautious, slightly introvert, image. I hope that this report is encouraging the profession to look around it, to look for opportunities which are near at hand, and to expand in that way. The probability of success is much greater if we look to using our expertise in adjacent areas, rather than further away.

Another theme of the report is that we have to do something. Our own estimate of supply exceeds demand in 2005. On central estimates, the difference is not that great, and so I do not think that we should give up or panic, but it is 10% or so. The individual actuaries and the profession will need to work hard to correct that imbalance; it is not impossible. If you looked at any realistic projection of supply and demand where supply is not restricted, you, almost inevitably, will get this position.

As several contributors to the discussion have said, if anything, our central estimates are probably on the optimistic side. All that that does is to increase the challenge. Not only does supply exceed demand, it is also the wrong sort of demand. We postulate that there will be too many life assurance trained actuaries and not enough general insurance actuaries. Many hundreds of us are going to have to retrain.

We have also probably got the wrong sort of actuaries. Many of the new tasks involve a greater degree of inter-personal skills and communication skills. These tasks also need a greater degree of understanding of uncertainty, as some speakers have said, and the ability to adapt to new situations.

One of the things that I have found is that there is a resistance to the use of stochastic modelling. That is because we are more comfortable with reducing solutions to virtual certainties, rather than dealing with the uncertainty itself. The shift that the profession needs to make is probably best encapsulated by a comment that I heard about changing the Institute's motto from 'Certainty from Uncertainty' to 'Less Uncertainty out of Uncertainty'.

It seems to me that the amount that the profession needs to do is considerable. To a greater or lesser extent, almost all of us, on the scenario projected, will have to change and adapt to new techniques, applied to new products and to new markets. Several speakers have asked how the profession is defined. One of the interesting things that comes out of the study is that the people in the profession in 2005 are, more or less, the same people as are in it now. A few will have retired or died. A lot of present students will have qualified, and there will be some survivors of the next 10 years' intake of new students. However, one way or another, it is up to the present Fellows and students to plot our own future, as individuals, through the employer and through the profession. One way or another we have to make our own future.

I hope that I have covered some of the points that were raised, and I will certainly take them on board, working out what we are going to propose to the Councils in May 1996.

The Senior Vice President (Mr P. N. S. Clark, F.I.A.): On my own behalf, and on behalf of the profession as a whole, I express our grateful thanks, first to Mr Paul Coombes for stirring up this hornets nest, then to the closer for his very able Chairmanship of the Working Party, to the members of the Working Party who were all given specific tasks to find out things and produce ideas, and to Mr Campbell for his beavering away, pulling a lot of the threads together and getting the report into our hands. It has been a tremendous amount of work by a large number of people, and we are extremely grateful to them.

The real way we show our thanks is to take the report seriously, to discuss it, to argue it, to disagree with it, and then to bring forward our own opinions. It was discussed at the Faculty in November 1995, and now it has been discussed here. It is also going round the regional societies. I also suggest that people discuss it in groups within offices. It is a vital topic. Actuaries are under threat. I do not say that we are going to go into oblivion, as one or two speakers have so graphically

put it, but we are under threat. Yes, we have the prospect of Pensions Scheme Actuaries, and that statutory backing. However, in what was otherwise quite a nice article about actuaries which started "I have a sneaking admiration for actuaries", there was the rather damning paragraph that said, "The bad news for actuaries is that they look silly and somewhat spineless. It seems many of them knew about the pensions mis-selling fiasco all along, but lacked the guts or the influence to do anything about it."

Yes, we have Appointed Actuaries in life insurance companies, but how important are we? There are mutterings, and some of them are getting louder, about the desirability of having employed Appointed Actuaries. Then there is this great white hope of the General Insurance Actuary. On the front page of *Post Magazine*, last week, there was the suggestion that other people had other ideas about that.

Let me quote one sentence (¶21.1(6)), from 'The Future of the Profession': "In the fast changing world of public expectations, actuaries are still seen as impartial or supportive of consumers' interests as well as commercial considerations". I believe, very strongly, that what is vital for the future profession of the actuary is the continuing integrity of individual actuaries to uphold the highest professional standards, and each generation of actuaries has to work that integrity out for itself.

I cannot do better in closing than to use the last two sentences from Mr Daykin's Presidential Address, where he said: "We must build the confidence of our clients, our employers and the ultimate consumers of our services, so that we can fairly say "You can trust an actuary." We are the profession that turns financial promises into reality".

I ask you all to show your appreciation to Mr Nowell and the other members of the Working Party for the tremendous work that they have done in bringing this report to us.