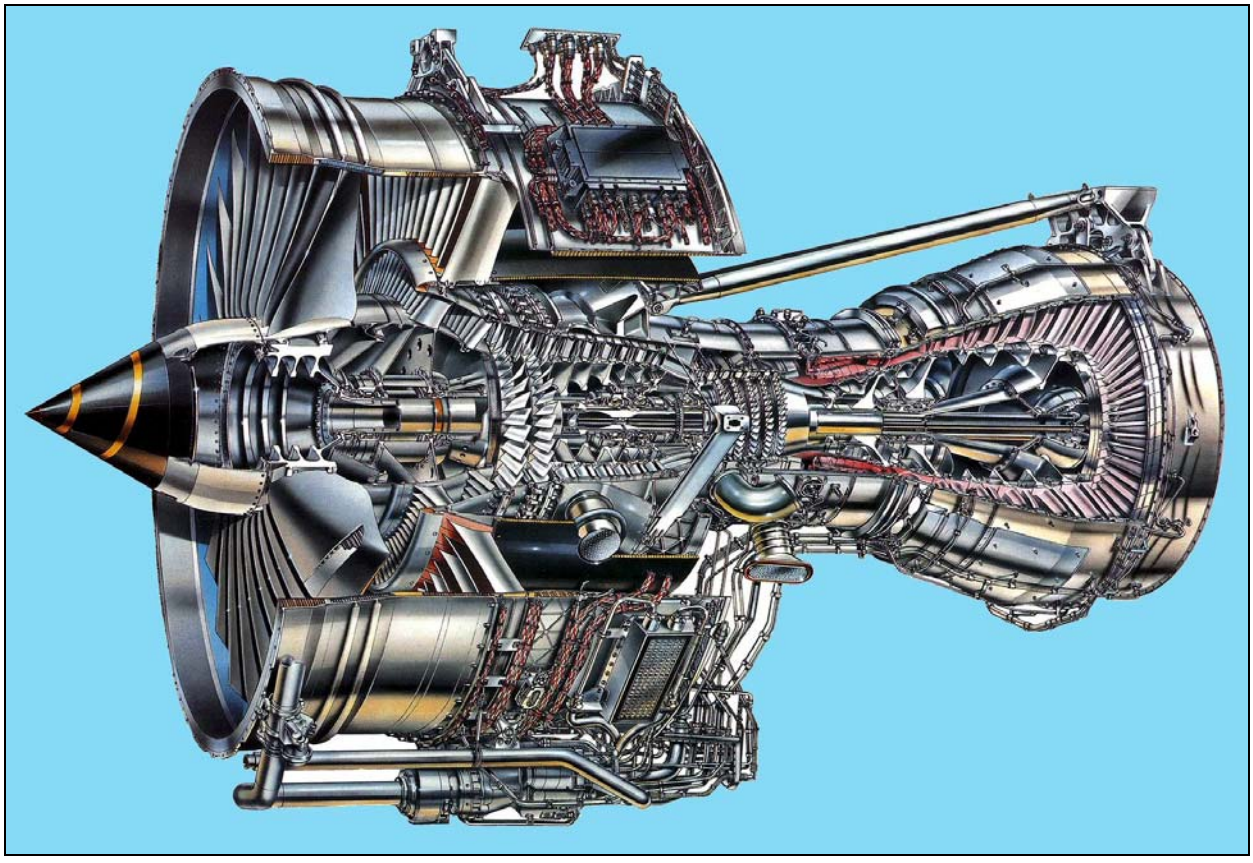
An Engine for Change

A Chronicle of the Engineering Council



by

Colin R Chapman & Jack Levy

The illustration on the front cover shows a 21st century Engine for Change, a Rolls-Royce Trent 900 turbo-fan [© Rolls-Royce plc 2004] and is reproduced by permission.

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Why Isn't There an Engineers' Corner in Westminster Abbey ?

[The explanation is given on page 10]

The above illustration formed one of the posters prepared by Ron Kirby for the "Engineering awareness" campaign in 1983 – see Chapter 2.

An Engine for Change
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CONTENTS

and arrangements within chapters

Arrangements within Chapters

By means of identical sub-headings it is possible chapter by chapter to follow the progress of specific activities and themes over the entire period of the Chronicle. Within each of Chapters 2 to 7 there are sections on:
People (and Policies) involved, including contact with **Government**, and then generally in the following order
Interfacing with:

- **Institutions**, including Nominated and Authorised Bodies
- **Registrants**, including the Regional Organisation and Assembly
- **Schools**, subdivided into WISE, Neighbourhood Engineers, Young Engineer for Britain, Technology Enhancement Programme
- **Further and Higher Education**, including SARTOR and the EngC examination
- **Continuing Education and Training**, later termed CPD
- **International**, including Eur Ing and the Washington Accord
- **Industry**, including Industry Affiliates
- **The Public**, including Public Relations work

At the end of some Chapters there are additional notes about people involved and opinions expressed.

List of Figures

Preface

In 1999, when the idea first arose of compiling a history of the Engineering Council the intentions were straightforward. We were asked to outline how and why the Engineering Council had been established and to describe its objectives, relationships and activities. The Chronicle was conceived simply as orientation for the benefit of new members of the Engineering Council's Senate, Boards, committees and staff.

During the writing, our work was overtaken by events that we describe in the text. At the end of 2001, the original Engineering Council was replaced by two separate but linked bodies: the Engineering Council UK, and the Engineering and Technology Board.

In consequence, what was substantially intended to be an 'in-house' document has been broadened to become a chronicle of the central body of the UK engineering profession between 1981and 2002. It spans the period from the outcome of the Government's 'Finniston' report to the division of the Engineering Council – the EngC – into the Engineering and Technology Board and the Engineering Council UK – the EC^{UK}. This relatively brief life perhaps reflects the often-voiced view that the engineering profession is fatally divided among itself and that any attempt to unify it is doomed to fail.

Not that we rate the EngC as a failure, except in a technical sense. The following pages amply demonstrate considerable successes in important areas, often with the support of the Institutions and other stakeholders but sometimes in spite of them. The successes were due firstly to hundreds of registered engineers and those from other walks of life, who served on the EngC's Council (later, Senate) and its many Boards and Committees. They were drawn widely from industry, the Institutions, universities, the forces and the business world, and gave unstintingly of their time entirely on a voluntary basis. Their efforts led the way to improving engineering education and training and helped towards improving the performance of British industry. Particularly in the case of the Chairmen of some EngC internal bodies, their dedication to the cause went far beyond the call of duty.

Secondly the successes were due, in our view, to an exceptionally well-qualified and experienced team of EngC staff at all levels. These men and women were responsible for guiding the Council, Boards and Committees and ensuring that their policies and initiatives were successfully pursued. The staff also worked effectively to maintain sustainable relationships with Government and with many national and international organisations.

To help in compiling this Chronicle we invited opinions from all the above individuals, from the Engineering Institutions and from numerous other bodies. There was a large and well-considered response and many of the inputs are quoted or referred to in our text. Where this has not proved practicable, a selection of such contributions will be found in annexes H and I. We thank all those who replied.

Finally we trust that, besides its purely historical interest, this Chronicle will be of assistance in the future to those responsible for the progress of the engineering profession and the well-being of UK industry and business.

Colin Chapman
Jack Levy **January 2004**

Abbreviations and Acronyms

ABET	Accreditation Board for Engineering and Technology [USA]
ACARD	Advisory Council for Applied Research and Development
AcRep	Accreditation Representative
ASSET	Association for Schools' Science Engineering and Technology
BEAMA	British Electrotechnical and Allied Manufacturers' Association
BEng	Bachelor of Engineering
BEP	Board for the Engineering Profession
BER	Board for Engineers' Registration [1982 – 1995]; Board for Engineers' Regulation [from 1996]
BNCIEA	British National Committee for International Engineering Affairs
BTEC	Business and Technician Education Council
CGLI	City and Guilds of London Institute
CBI	Confederation of British Industry
CC	Coordinating Committee
CCC	Coordinating Committee for Chartered Engineers
CCIT	Coordinating Committee for Incorporated Engineers and Engineering Technicians
CEC	Commonwealth Engineers' Council
CEI	Council of Engineering Institutions
CET	Continuing Education and Training
CEng	Chartered Engineer
CPD	Continuing Professional Development
CRAC	Careers Research and Advisory Council
CREST	Creativity in Science and Technology
CWITG	Communications with Institutions' Task Group
DEE	Department of Education and Employment
DES	Department of Education and Science
DfEE	Department for Education and Employment
DMPA	Directorate of Marketing and Public Affairs
DTI	Department of Trade and Industry
EA	Engineering Authority [Finniston]
EA 1	Engineering Applications 1 [Finniston]
EA 2	Engineering Applications 2 [Finniston]
EBP	Education Business Partnership
ECCO	Engineering Careers Co-ordinating Organisation
ECITB	Engineering Construction Industry Training Board
ECRO	Engineering Council Regional Organisation
ECROC	Engineering Council Regional Organisation Committee
EC(UK)	Engineering Council (UK)
EDEXCEL	Educational Excellence [an awarding body]
EEC	European Economic Community
EEF	Engineering Employers' Federation
EES	Engineering Education Scheme
EGC	Executive Group Committee
EIJC	Engineering Institutions' Joint Council
EITB	Engineering Industry Training Board
EMF	Engineers' Mobility Forum
EMG	Engineering Marketing Group

EMTA	Engineering and Marine Training Authority
EngC	Engineering Council
EngCRep	Engineering Council Representative
Eng Tech	Engineering Technician
ENVOX	Engineering Voice [vox is Latin for voice]
EOSG	Engineering Occupations Standards Group
ERTEC	Eastern Region Teacher Education Consortium
ETA	Engineering Training Authority
ETB	Engineering and Technology Board
Eur Ing	European Engineer
F&GP	Finance and General Purposes
FE	Further Education
FEANI	Fédération Européenne d'Associations Nationales d'Ingénieurs
GEC	General Education Committee
GNVQ	General National Vocational Qualification
HE	Higher Education
HITECC	Higher Technology and Engineering Conversion Courses
HNC	Higher National Certificate
HND	Higher National Diploma
IA	Industrial Affiliate [until 1989]; Industry Affiliate [from 1989]
IAN	Industry Affiliate Network
IEDP	Integrated Engineering Degree Programme
IEng	Incorporated Engineer
INPUT	Industry Projects – Understanding Technology
ISC	Industry Standing Conference
IT	Information Technology
IWG	Institution Working Group
JAP	Joint Accreditation Panel
JVG	Joint Venture Group
MEng	Master of Engineering
MSC	Manpower Services Commission
NAC	Nomination and Audit Committee
NATFHE	National Association of Teachers in Further and Higher Education
NC	Nominations Committee
NCEET	National Conference on Engineering Education and Training
NCVQ	National Council for Vocational Qualifications
NE	Neighbourhood Engineers
NVQ	National Vocational Qualification
ONC	Ordinary National Certificate
OND	Ordinary National Diploma
OWOE	Opening Windows On Engineering
PCFC	Polytechnics and Colleges' Funding Council
PE	Professional Engineer [USA, Canada]
PICKUP	Professional Industrial and Commercial Updating Programme
PYE	Professional Young Engineer
RAEng	Royal Academy of Engineering
REDIA	Regional Directory of Industrial Affiliates
RSA	Royal Society of Arts
RVQ	Review of Vocational Qualifications
SARTOR	Standards And Routes TO Registration

SATROS	Science And Technology Regional Organisations
SCPI	Standing Committee on Professional Institutions
SCI	Standing Committee on Industry
SCRA	Standing Committee on Regions and Assembly
SCSST	Standing Conference on Schools Science and Technology
SCUE	Standing Conference on University Entrance
SET 7	Science, Engineering and Technology Week
SETNET	Science Engineering Technology Network
SIWG	Schools' Institution Working Group
STO	Science and Technology Office
SWG	Strategy Working Group
TASC	Teaching AS a Career
TEC	Training and Enterprise Council
TEng	Technician Engineer
TEP	Technology Enhancement Programme
TTNS	Times Network News Service
TVEI	Technical and Vocational Engineering Initiative
UFC	University Funding Council
UGC	University Grants Committee
UKAPE	United Kingdom Association of Professional Engineers
WFEO	World Federation of Engineering Organisations
WISE	Women Into Science and Engineering
YEB	Young Engineer for Britain [until 1994]; Young Engineers for Britain [from 1995]
YELC	Young Engineers' Liaison Committee

Chapter 1 – Starting the Engine

The Professional Engineer and Society

Members of the engineering profession are collectively responsible for technical progress, management and leadership in all elements of industry – research, development, design, production, marketing and maintenance, not to mention the financial arrangements necessary for success. These elements are, so to speak, the genes making up engineering's DNA and have always to be pursued with an eye to safety, reliability, efficiency, sustainability and economy. Nowadays these responsibilities cover not just engineering hardware but the associated software too. Professional engineering, therefore, engages the whole industrial enterprise and is far broader than the technology of production, even if production is its most obvious aspect.

The granting of a Royal Charter on 27 November 1981 to the newly formed Engineering Council was a significant milestone in a story dating back over 200 years to the time when the Society of Civil Engineers was formed by John Smeaton in 1771.

Ever since then debates, often heated, have been aired on the place of professional engineers in society, on the relationship of engineering to other professions and on the role of engineers in industry, especially manufacturing industry. At the heart of these debates has been the jealously guarded principle of self-regulation - that is the right of those in the profession, and in membership of a recognised Institution, to make their own rules concerning standards and professional conduct, and to discipline those members who contravene those rules. The consultations and discussions immediately preceding the founding of the Engineering Council brought out in full measure the issue of self-regulation versus the alternative of statutory parliamentary control.

The situation on professional engineering regulation in the United Kingdom happens to be more complex than in most other countries. This is because of the way the 'learned society' role of our engineering Institutions (spreading knowledge and encouraging research) has been combined historically with them acting as *qualifying* bodies (setting standards for those persons wishing to enter the profession).

The process in the United Kingdom has additionally been complicated by a proliferation of Institutions, each with its own specialist interests, to the point where The Engineering Council, on its formation in 1981, had to take on board 53 Institutions of which 16 had Royal Charters.

Comparison with practices in other countries is instructive. Broadly speaking there are two methods overseas by which qualifications are regulated and the profession is organised.

In some countries, such as Australia, Ireland and New Zealand there is a single "Institution of Engineers" which, besides pursuing learned society activities, also carries responsibility for the standards and awarding of professional engineering qualifications. This is viable because the single Institution can maintain uniform standards across all branches of the profession.

In other countries there may be more than one engineering Institution but the award of qualifications to national standards is then the responsibility of a central organisation. This

may be controlled either by the local government (as for the *Professional Engineer (PE)* title in the USA and Canada) or by the central government (as in France, Germany and other European countries for the *Diploma Ingenieur (Dipl.Ing)* or similar title).

Only in the United Kingdom have there been historically numerous engineering Institutions each with its *own* charter responsible for awarding qualifications, albeit with some informal mutual understanding about the levels of education and training required.

Events leading to the formation of the Engineering Council

The reasons for, and the events leading to, the formation of the Engineering Council are fully documented in Grant Jordan's excellent book *Engineers and Professional Self-Regulation* published by the Clarendon Press, Oxford in 1992. For those wishing to understand the whole detailed story that book is compulsory (and at times compulsive) reading. Notwithstanding, we outline here a brief chronological summary of the main events and motivations:

- 1771 – John Smeaton, a Fellow of the Royal Society and taking an interest in engineering, forms the Society of Civil Engineers as a dining club for members to discuss engineering matters. The Society, after his death, is called The Smeatonians.

- Early 19th Century – Mechanics' Institutes are formed throughout the United Kingdom.

- 1818 – The Institution of Civil Engineers (ICE) is founded [and granted a Royal Charter in 1828]. Its object is to facilitate "the acquirement of knowledge necessary in the civil engineering profession and for promoting mechanical philosophy".

- 1840, or thereabouts – A Mechanics' Institute in the Midlands, the Birmingham Railway Engineers, becomes particularly interested in engines and locomotives rather than roads and bridges. Lead by George Stephenson, who is believed to apply to the ICE but has his application rejected, in 1847 this group forms the Institution of Mechanical Engineers (IMechE) [Royal Charter granted 1930].

  This sets a pattern of fragmentation of the profession which continues as each successive branch of engineering establishes its own body – Naval Architecture in 1860, Gas in 1863, Aeronautical in 1866, Electrical in 1871, Mining in 1889, Marine in 1889, Materials in 1889, Mining and Metallurgy in 1892, Water and Environmental in 1895, Building Services in 1897, Foundrymen in 1904, Structural in 1908, Chemical in 1922, Energy in 1929, Measurement and Control in 1944, and Computer Science in 1957. The formal names of these Institutions soon become:

  Royal Institution of Naval Architects [formed 1860 / granted Royal Charter 1910].
  Institution of Gas Engineers [1863 / 1929].
  Royal Aeronautical Society [1866 / 1949].
  Institute of Materials [1869 / 1933].
  Institution of Electrical Engineers [1871 / 1921].
  Institution of Mining Engineers [1889 / 1915].
  Institute of Marine Engineers [1889 / 1973].
  Institution of Mining and Metallurgy [1892 / 1915].
  Institution of Water and Environmental Management [1895 / 1995].
  Institution of Building Services Engineers [1897 / 1976].

Institute of British Foundrymen [1904 / 1921].
Institution of Structural Engineers [1908 / 1934].
Institute of Physics [1918 / 1970].
Institution of Chemical Engineers [1922 / 1957].
Institute of Energy [1929 / 1946].
Institute of Measurement and Control [1944 / 1975].
British Computer Society [1957 / 1984].

Subsequently, however, as a result of amalgamations and mergers, several of these Institutions modify their names, as we shall explain in later chapters of this Chronicle.

Many Institutions are also founded which are mainly concerned with levels differing from Chartered Engineer, now known as *Incorporated Engineer* and *Engineering Technician*. Of these, the largest, the Institution of Incorporated Engineers in Electronic, Electrical and Mechanical Engineering (IIE) formed by a later amalgamation of some Institutions concerned with Incorporated Engineers and Engineering Technicians, receives a Charter in 2001 following the raising of its standards to degree equivalent.

- 1923 – The first attempt at formal collaboration between the Engineering Institutions. An Engineering Joint Council (EJC) is set up comprising the ICE, IMechE, IEE (often termed the 'Big 3' on account of the size of their memberships) with the Royal Aeronautical Society (RAeS) and the Institute of Marine Engineers (IMarE). The EJC becomes moribund in about 1937.

- 1962 – The second attempt at collaboration. An Engineering Institutions' Joint Council (EIJC) is created also on the initiative of the 'Big 3'. The EIJC has objectives to "Promote and *co-ordinate* [our italics] in the public interest the development of the science, art and practice of engineering".

- 1965 – The EJIC grows into the Council of Engineering Institutions (CEI), a body with its own Royal Charter and broadly the same remit as the EIJC. This is a marked step forward in collaboration between the Institutions as the CEI now sets the standards for registration and, most significantly, holds the Register of Chartered Engineers (CEng), Technician Engineers (TEng) - later becoming Incorporated Engineers (IEng) - and Engineering Technicians (Eng Tech). This centralising of standards and of the Register is generally welcomed by the "Big 3" because they suspect that some of the other Institutions are adopting low standards for the sake of increasing their membership.

However, the constitutional arrangements of the CEI are always unsatisfactory from the point of view of the larger and longer-established Institutions, and grow progressively more so. Although each member Institution has one vote on the CEI Board, 75% of the Chartered Engineers are members of the "Big 3". For this and other reasons the CEI becomes, by general perception, ineffectual especially in regard to the public status of the profession, notwithstanding some success in the standards field. Even here, however, the IEE believes that the required minimum standards are too low and that there is too much resistance to raising them.

- 1974 – By this time the dissatisfaction is growing to the point where the "3 Presidents" produce a paper proposing a new "Institution of Engineers" (IE) that will have directly-elected members on its Board rather than Institution representatives. The IE is to look after all professional matters such as representation of the engineering profession and will control qualifications, whilst the Institutions will confine themselves to advancing the state of engineering knowledge - the "learned society" function. The "Big 3" reckon that, because of their size, the majority of the elected IE Board will come from their memberships. Needless to say this is not wildly appealing to the smaller bodies and, after a number of attempts at compromise, the IE idea is dropped in favour of a relatively small adjustment to the CEI constitution allowing its Board to contain a mix of elected and nominated members.

- 1975/76 – Because of the continuing feeling that the CEI is not making the desired impact, calls begin to be made for a Royal Commission or other type of Government enquiry into the engineering profession. These calls emanate mainly from the IEE, whose Secretary Dr George Gainsborough is particularly active, and also from the elite Fellowship of Engineering (now the Royal Academy of Engineering), from trade unions, and also from some of the non-chartered engineering institutions. The Trades Union Congress passes a unanimous resolution (in 1976) that is moved by John Lyons of the Electrical Power Engineers' Association. The resolution runs "Convinced that the Engineering Profession has a vital role to play in the regeneration of British industry, Congress calls on the Government to set up, without delay, a powerful Committee of Inquiry into the role, function and use of qualified engineers in British industry". This influences Government, and the Department of Trade and Industry is drawn into the discussions by the perception that improvements to the engineering profession's standards and status could have a beneficial effect on the performance of British manufacturing industry. [Its share of GDP fell from 33 % in 1963 to 29 % in 1973. Worse still, British manufacturing productivity in 1973 was less than 50% that of Japan and 40% that of the USA.]

- 1977 – Although opinion both within and outside Government is not unanimously in favour, a "Committee of Inquiry into the Engineering Profession" is announced to Parliament on 5 July 1977 and the inimitable Sir Montague (known by all as Monty) Finniston appointed as Chairman. Its membership [Annex A] is announced on 14 December 1977. The terms of reference are, *for manufacturing industry* [our italics] and in the light of national economic needs, to review and make recommendations on:

  (a) the requirements of British industry for professional and technician engineers, the extent to which these needs are being met, and the use being made of engineers by industry;
  (b) the role of the engineering institutions in relation to the education and qualification of engineers at professional and technical level;
  (c) the advantages and disadvantages of statutory registration and licensing of engineers in the United Kingdom;
  (d) the arrangements in other major industrial countries, particularly in the EEC, for handling these problems, having regard to relevant comparative studies.

The work of the Finniston Committee is on a grand scale. About 500 individuals and 200 companies respond and 1600 documents are studied. Visits are made to seven European Countries and to the USA, Canada and Japan. However – and this point rankles with Institutions throughout the Committee's lifetime and long after – the main Committee never once visits a single Engineering Institution to find out at first hand about its standards and working practices or about its plans for development.

As we look back from today, it can be seen that this lack of harmony with the Engineering Institutions was destined to have a profound effect on the reception of the Finniston Report. In fact, one of the Committee's five working groups *did* undertake such visits, giving favourable comment on the large Institutions and unfavourable views on the CEI, especially regarding its failures in public relations. However, the Institutions felt the need, justifiably perhaps in view of their role as major players, of attention from the main committee.

- 1980 – Notwithstanding the problems encountered from 1977, the Finniston Committee Report "Engineering our Future" is published in January. The late insertion into its terms of reference of the phrase *for manufacturing industry* (see above) leads to the rather curious format in which the first two chapters answer the question "What's wrong with British manufacturing industry ?" and the last four address the different question "What needs to be done about British engineers and the organization of their profession?". This in turn leads some people to the misconception that the ills of manufacturing industry could be solved by the adoption of Finniston's remedies, especially his major recommendation to establish a *statutory* (i.e. responsible to Government) Engineering Authority to act as an 'Engine for Change'.

In all, the Finniston Report made 80 recommendations, the majority being directed towards Government and engineering employers. These were followed by some proposals to improve school education, the 'formation' of engineers and the (diminished) role of the Institutions. It was only at recommendation 77 that the new Engineering Authority (EA) was described – though fuller reasoning and details appeared earlier in the body of the Report. In essence, the Report recommended that the EA should be a Statutory Body, funded by Government, with 15-20 members appointed by the Secretary of State to reflect the balance of interests within the engineering dimension. Its members, the majority of whom would be engineers, would serve in an *independent* capacity (i.e. there would be no Institution *representatives*).

The ensuing great debate of the Finniston Report revolved almost entirely around the Engineering Authority proposal – which Sir Monty himself had said was the only one of the 80 proposals that was non-negotiable! This attitude was understandable because the EA would, if established, become the "Engine for Change" to implement all the other recommendations. Sir Monty maintained that many previous reports had gathered dust on the shelves simply because they lacked this vital central ingredient.

However, the idea of the statutory authority responsible to Government did not go down too well in most of the Engineering Institutions - they valued the principle of self-regulation and could see no place for themselves on the EA. Neither was the EA proposal favoured in some quarters of industry (e.g. the CBI) which saw it as another layer of bureaucracy, with the danger that licensing of engineers would follow. It was perceived this would mean that some jobs could be performed legally only by registered engineers, so limiting firms' freedom of

selection for employment, although some such jobs might be performed equally well by physicists or mathematicians.

These circumstances serve to emphasise why engineering, although similar to other professions such as law, medicine and accountancy, in requiring high levels of knowledge and integrity, is fundamentally different from them because much of the work by those other professionals is undertaken directly in contact with members of the public and so a statutory route is necessary to protect individual clients from exploitation by unscrupulous practitioners. In contrast, almost all engineers work in teams and usually their 'clients' are companies that also have professional engineers on their staffs. In such circumstances the crucial question is whether a statutory route is appropriate, with a Minister in control, or whether Chartering, with responsibility to the Privy Council (and so minimising the appearance of political control) is more appropriate.

There was also some discussion within the Finniston Committee as to whether the new body, irrespective of whether statutory or chartered, should be given to the Fellowship of Engineering, now the Royal Academy of Engineering. However, it was concluded that the timing was wrong as the Fellowship had only recently been established as a super-elite body and its purposes were different.

In Government circles, too, there was disagreement on the statutory versus chartered question, both within and between Departments. The debates were at times heated and there was a good deal of political in-fighting. A source inside the Ministry has since stated:

"I seem to recall that within the DTI Sir Peter Carey, the then Permanent Secretary, Sir Monty, Jack Leeming and others felt that the mood was moving towards the setting up of a statutory body, which in fact was the main recommendation in Sir Monty's report; but then the influence of the Institutions' lobby against the recommendation was strong enough to eventually dissuade Sir Keith Joseph in favour of a regulatory body which is what The Engineering Council became. It has to be said, though, that it was a close run thing."

So, in the event, the Minister Sir Keith Joseph, decided that the new body should be Chartered, i.e. receive a Royal Charter.

CEI Valediction

Thus, at the end of 1981, but with its midwives still in contention, the Engineering Council was delivered to the world. The Chairman of the CEI, Dr Wilfred Eastwood, in his valedictory message, summarised some previous achievements:

When the Engineering Institutions' Joint Council was set up, it was perhaps primarily the brainchild of the Duke of Edinburgh who saw the need to being the various branches of the profession together. Prior to the initiative which he instigated, contacts between the Institutions were inadequate and in some cases non-existent. The flood flow of change which was taking place in higher education in the early 1960s required bold decisions concerning the qualification process for professional engineers. The profession needed a new public image. The individual engineer had a yearning for greater status in the community.

Lord Hailsham, the then Minister for Science, was sympathetic to the new organisation and undertook to support its petition for a Royal Charter. But he laid down conditions. It must proceed with all reasonable speed to raise the academic standard for entry to the profession to that of a degree of a

British university, and it must maintain bridges and ladders so that it was still possible to achieve professional status the 'hard way'.

The charter was granted and we became the CEI. Rather self-consciously engineers began to use the letters CEng and the title Chartered Engineer. This title is now recognized by other professionals, and is gradually becoming understood by the community at large. It unifies us and confers status. We like it.

Within the shortest possible time, given that the interests of those in the pipeline had to be protected, the examinations of the various Institutions were phased out and CEI's own examination system was introduced. Those entering the profession the 'hard way' had to satisfy the old academic standard by 31 December 1970 and complete the training and experience requirements by 31 December 1973. The rapid transition to a fully graduate standard of entry to chartered status was perhaps CEI's greatest achievement.

There was less dramatic success in the attempts to introduce properly monitored training. The Civils group of Institutions had sponsored training schemes and had run a Part III examination or test for many years, but most Institutions merely required, and almost invariably accepted, a signed statement that the candidate had been given appropriate training and/or experience. After the Finniston report that was a gradual recognition that training must be taken more seriously. There has been an even faster change of attitude since the Engineering Council was formed. The prospect of hanging!

The Fellowship of Engineering was founded under the CEI charter. Our profession needed a body like the Fellowship and CEI made it possible. The charter could be adapted to accommodate the Fellowship and there was a ready made secretariat.

In the field of public affairs it is not easy to point to tangible achievements of CEI, but we have been consulted on many matters by Government and our advice has been well received. There is good reason to believe that our voice has been heard on matters of public interest such as health and safety at work and on trade union affairs. But lack of resources has limited our achievements.

CEI has been well worthwhile. Its successes have been the result of much voluntary effort. Many people have given a great deal of time, in some cases travelling long distances, to serve on its committees, including those of the Engineers' Registration Board. The branches have done sterling work, particularly in the field of careers and recruitment. Academia has provided willing and able examiners. To all these people the profession owes thanks.

I must also pay tribute to the staff. The professional standards of our secretariat have always been high, but in the period since the Engineering Council was formed they have shown great loyalty, and have worked cheerfully and efficiently despite the uncertainties with regard to their future. We have indeed been fortunate.

Finally, I take this opportunity to wish the Engineering Council well. The discussions and negotiations leading to the decision to transfer the three registers of the ERB and also the CEI examinations system have been carried out in a spirit of great goodwill on both sides. The Engineering Council has a much wider remit and is more independent financially than the CEI. It is more likely to be able to improve the performance of our engineering industry and the status and rewards of the profession. But to succeed, it needs unstinting support from each individual engineer, a generous encouraging attitude from the Institutions, and time. I ask all to help in every way possible.

Eighteen years later, in 1999, when the newly adult Engineering Council had just come of age, Dr. Robert Hawley its then Chairman, with Government encouragement, formed a group to review the situation in the light of circumstances of the day. The outcome was to create a new 'Engineering and Technology Board' with a broader remit to take over the Engine for

Change role, leaving an associated 'Engineering Council (UK)' to continue the successful registration and qualification function. This new arrangement finally came into force in February 2002.

The Chronicle

This Chronicle recounts the story of the Engineering Council between November 1981 and February 2002.

Fig. 1 shows, with the aid of the EC's first logo, the four main directions in which the EC faced - the Profession (including the Institutions), the Government, the Education System and Industry/Employers. If a third dimension, extending out of the page is added, this can represent the public and the international community.

Within each of the chapters that follow we have generally followed a standard pattern. This will enable readers who dip into our descriptions of the various eras of the Engineering Council to find related events at similar points in each chapter. The pattern that we have chosen deals first with *People* - the main players such as the Chairman, Director-General, other Directors, Committee Chairmen, and Committee structures and activities. We then, under the heading of *Interfacing with the Institutions*, describe events relating to the Institutions, the Engineers' Professional Forum and other meetings of Institutions' Presidents and Secretaries or Chief Executives. Then, under the heading of *Interfacing with Registrants*, we follow activities of Registrants, the Register itself and the Engineering Council Regional Organisations and related local groupings. After this we discuss Education and Training, dealing first, under the heading of *Interfacing with Schools*, with schools and schemes such as *Women Into Science and Engineering*, *Neighbourhood Engineers* and *Young Engineers for Britain* and then, under the heading of *Interfacing with Further and Higher Education*, with further and higher education, including *Standards and Routes to Registration* (SARTOR), the Engineering Council's *Examinations* and *Continuing Professional Development*. We then, under the heading of *Interfacing Internationally*, look at International matters, including the work of the European Engineers' Federation (FEANI) and the British National Committee for International Engineering Affairs. Towards the end of each chapter, under the heading of *Interfacing with Industry*, we review relationships between the Engineering Council and industry, mainly through the Industry Affiliate scheme, and lastly, under the heading of *Interfacing with the Public*, we look at a variety of initiatives including publicity, the environment and other national issues under the broad umbrella of public affairs. Finally, we conclude some chapters with additional remarks on the departure and arrival of Chairmen, senior staff and others who have made noteworthy contributions to the Engineering Council.

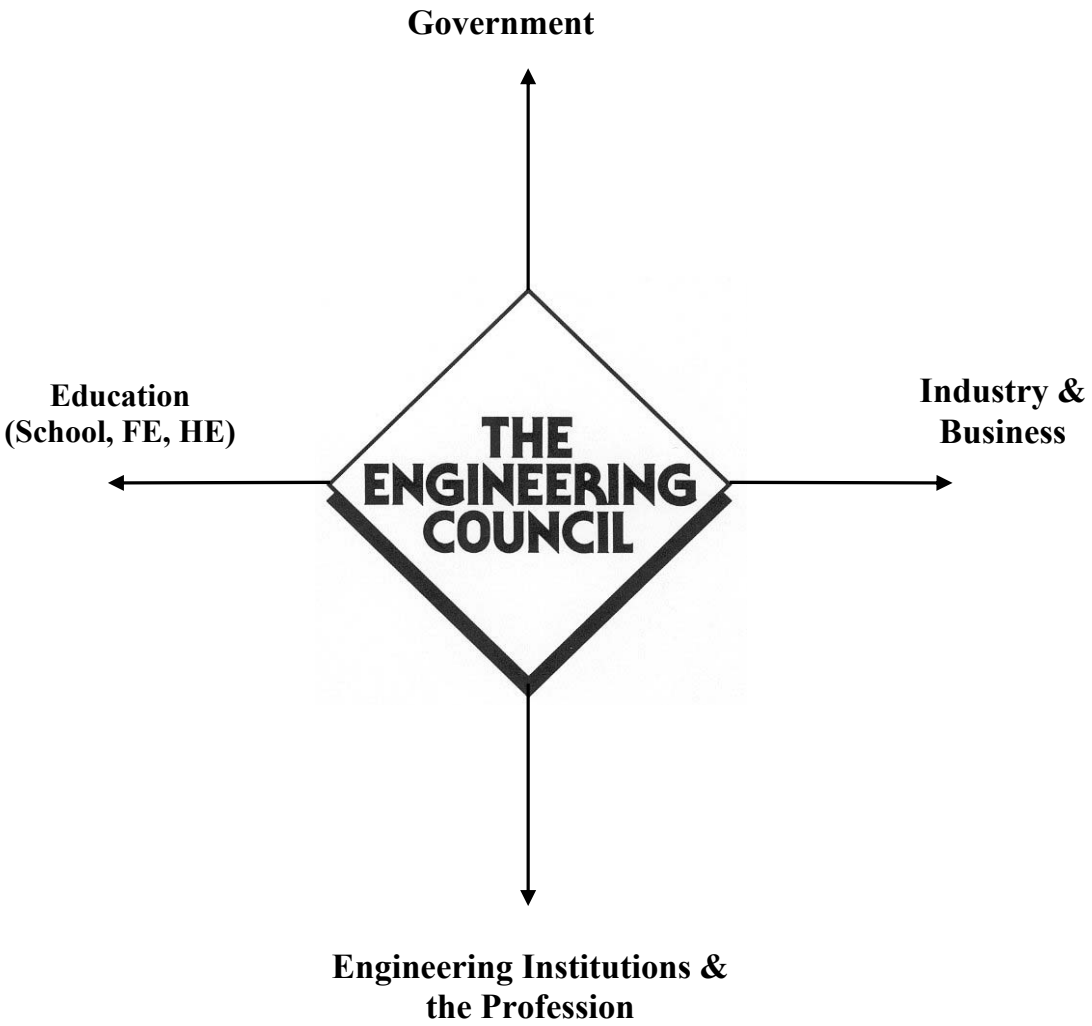

Fig. 1 The Diamond-shaped First Logo of the EngC

With arrows added to show the four principal directions of action and liaison.
The logo itself faces outward to the public

Engineers and Scientists and Westminster Abbey

The reason that there is no "Engineers' Corner", as Dean Stanley explained in 1890 in his *Memorials of Westminster Abbey*, is that the corners of the Abbey, founded in 1066, were quite full of monuments when engineering emerged as a recognisable discipline. Nevertheless, many engineers, architects, scientists and technologists are buried or commemorated throughout the Abbey, mingling with writers, artists and ecclesiastics, just as they were in life, although in many cases occupying even more prominent situations, such as the Nave. For the record, references to the following may be discovered in Westminster Abbey:

Individual	*Died*	*Profession*
NW (Belfry) Tower		
John Conduitt	1737	Scientist
William Horneck	1746	Engineer
Richard Trevithick	1833	Engineer
North Transept		
Sir Clifton Wintringham	1794	Physician
Nave, North Aisle		
Lord (Howard) Florey	1968	Scientist
Sir William Herschel	1822	Astronomer
Sir John Herschel	1871	Astronomer
John Hunter	1793	Surgeon
Sir Charles Lyell	1875	Geologist
Dr Richard Mead	1754	Physician
Dr Richard Noble	1754	Physician
John Smeaton	1792	Engineer
Dr John Woodward	1728	Geologist
Nave, Centre		
Sir Charles Barry	1860	Architect
Paul Dirac	1984	Scientist
Michael Faraday	1867	Scientist
George Graham	1751	Clockmaker
George Green	1841	Mathematician
Jeremiah Horrocks	1641	Astronomer
David Livingstone	1873	Explorer
James Maxwell	1879	Scientist
Sir Isaac Newton	1727	Scientist
John L Pearson	1897	Surveyor
Lord (Ernest) Rutherford	1937	Scientist
Sir Geo Gilbert Scott	1878	Architect
George E Street	1881	Architect
Sir J J Thomson	1940	Scientist
Thomas Tompion	1713	Clockmaker
Nave, South Aisle		
William Buckland	1856	Geologist
Dr John Freind	1728	Physician
Nave, windows		
Sir John Wolfe Barry	1918	Engineer
Isambard K Brunel	1859	Engineer
Sir Benjamin Baker	1907	Engineer
Lord Kelvin (Thomson)	1907	Scientist
Sir Charles Parsons	1931	Engineer
Sir Henry Royce	1933	Engineer
South Transept		
Sir Herbert Baker	1946	Architect
Dr Isaac Barrow	1677	Mathematician
Edward Wettenhall	1733	Physician
Sir William Chambers	1796	Architect
Stephen Hales	1761	Engineer
Sir John Pringle	1782	Physician
Sir Robert Moray	1673	Scientist
Sir Robert Taylor	1788	Architect
Joshua Ward	1761	Scientist
James Wyatt	1813	Architect
Choir, North Aisle		
John C Adams	1892	Mathematician
Hugh Chamberlen	1728	Physician
Charles Darwin	1882	Scientist
Sir Joseph Hooker	1911	Botanist
James Joule	1889	Scientist
Joseph Lister	1912	Surgeon
Dr John Plenderleath	1811	Physician
Sir Stamford Raffles	1826	Zoologist
Sir William Ramsay	1916	Scientist
George Stephenson	1848	Engineer
Robert Stephenson	1859	Engineer
Sir George Stokes	1903	Mathematician
Sir Alfred Wallace	1913	Scientist
St Paul's Chapel		
James Watt	1819	Engineer
St John's Chapel		
Sir John Franklin	1847	Artic Explorer
St Andrew's Chapel		
Dr Matthew Baillie	1823	Physician
Sir Humphrey Davy	1829	Scientist
John W Rayleigh	1919	Scientist
Sir James Simpson	1870	Scientist
Thomas Telford	1834	Engineer
Thomas Young	1829	Scientist
West Cloister Walk		
Dr William Buchan	1805	Physician
Sir Richard Jebb	1787	Physician
South Cloister		
Sir Edmond Halley	1742	Astronomer
RAF Chapel		
Sir Frank Whittle	1996	Engineer
The Confessor's Chapel		
[Edward the Confessor	1066	Clerk of Works]

Many of the memorials were erected long after the individuals died. The memorials to engineers Joseph Locke (d.1860) and William Siemens (d.1883) were destroyed in the Second World War and have not been replaced.

Chapter 2 - 1981 to 1985 : The Corfield Years

Establishing the Engineering Council

Getting Started

A Year of Establishment

And so the Engineering Council (EngC) was established by Royal Charter on 27 November 1981, not as the Statutory Body recommended by the Finniston Report, and not with the pomp that had accompanied the granting of a Royal Charter to the Council of Engineering Institutions (CEI) sixteen years before. On that occasion, in November 1965, Her Majesty The Queen and His Royal Highness, The Prince Philip, Duke of Edinburgh, the Founder President of CEI, had attended a reception held at the Science Museum to mark the CEI event. Representatives from 13 Member Institutions and many official guests, including the Presidents of a number of other professional bodies had also attended that function.

Notwithstanding the lower key launch in 1981, the EngC's Royal Charter offered the new body a powerful vision "to advance education in, and to promote the science and practice of, engineering (including relevant technology) for the public benefit and thereby to promote industry and commerce in our United Kingdom of Great Britain and Northern Ireland". There is here a distinct echo of the Finniston 'Engine for Change' vision to which we referred in the previous chapter. Obviously, underpinning the whole enterprise were the individual Chartered Engineers, Technician Engineers and Engineering Technicians registered with the CEI. These Registrants had now to be transferred to the EngC. It should be noted that the responsibility *for the public benefit and for British Industry* in the EngC Charter received no mention at that time in the charters or constitutions of any of the Engineering Institutions whose main purposes were, and are, to promote and preserve the standards and interests of their own disciplines and members. To set the EngC's national role in motion, a framework of committees of engineers and interested parties was put into place.

The First Council

According to the EngC's Charter the 24 members of its governing or management board were to be appointed from a list nominated by employers, engineering Institutions and individuals of standing drawn from professions other than engineering. An important provision, later to have a profound effect on the work of the EngC, was for the members to act in their own individual capacity and not as representatives. To launch the EngC expeditiously the Secretary of State for Trade and Industry, John Wakeham, immediately appointed a board chairman and 17 members. This management board was termed a Council, a title causing some confusion for commentators and engineers; references to "the Council" were construed by some to mean "The Engineering Council" as a whole, with all of its working groups, committees, consultants and employees, while others thought that only the management board was intended. Within this Chronicle we shall use Engineering Council or EngC to mean the whole body and organisation, and "Council" to mean the appointed or elected management board.

The first Chairman of the EngC was Sir Kenneth Corfield, head of the industrial complex Standard Telephones and Cables plc (STC), while the 17 Council members included many

well known names within engineering; these included Dr (later Sir) John Horlock, Vice Chancellor of the Open University who had been a member of the Finniston Committee, Ronald Hooker, Chairman of Henry Sykes Ltd., Joanna Kennedy a senior engineer at Ove Arup and Partners, Viscount Caldecott, President of the Fellowship of Engineering (who played a key role in many of the early negotiations and developments), Sir David Plastow, Managing Director and Chief Executive of Vickers Ltd., Baroness Beryl Platt, Chairman of the Equal Opportunities Commission and others equally well known in their own fields. Only in 1983 did the Secretary of State for Trade and Industry appoint seven more members to the Council, bringing it up to its full complement. The engineering membership of the Council was not confined to just Chartered Engineers: in 1983 John Waters, Laboratory Manager of Wimpey's Structures Laboratory, and in 1985 Norman Holland, UK Group Standards Manager at Philips Electronic & Associated Industries, both Technician Engineers, became Council Members and served on many of its committees. The full first membership of the Council is listed in Annex B.

Following their formal appointment in January 1982, the first meeting of the EngC's Council was convened on 8 February. This meeting was held around the great boardroom table of STC at Aldwych with no paid staff yet appointed. Sir Monty Finniston was invited to the meeting as a courtesy and to assist in the launch. He stated that he was "proud to have been included in this historic first meeting - though established in a different form to the Authority that the Finniston Committee had recommended". He emphasised that the Engineering Council Charter should be widely interpreted. "Teaching in schools, the pattern of education in universities and colleges, recruitment to industry, the role of women, continuing education, the role and relationships of Government, employers and educationalists - and many other aspects were implied." Among those attending the meeting, acting as secretary, was George Heard of STC who gave a great deal of shrewd and generous help in establishing the administrative function of the EngC.

Work commenced on a first policy statement to reflect much of the Finniston vision of the EngC acting as an 'engine for change', especially in manufacturing industry and in the fields of engineering, education and training. The Policy Statement, formally published in September 1982, also took account of the Royal Charter of November 1981and the National Conference on Engineering Education and Training (NCEET) held earlier in 1982. It was reproduced verbatim in the EngC's First (1982) Annual Report and appears in a shortened form in Annex C. Even after 20 years the Policy Statement has stood the test of time remarkably well.

£917,000 was given as a grant-in-aid from the Government for the EngC to fund its activities in 1982. It was made clear, however, that such Government funding was for a limited period only and that by mid-1985 the EngC would have to stand on its own financial feet. Several Council members were dismayed by this arrangement in comparison with the £40m budget proposed by Finniston to initiate engineering projects and research.

With the assistance of STC officials in the Spring of 1982 a search was made for suitable premises for the EngC and the sixth floor at the nearby Canberra House, 10 Maltravers Street was leased.

Sir Kenneth Corfield instituted an annual Strategy conference at which Council members and directing staff would spend a day and a half at Highgate House - a conference centre in Northamptonshire. The first was held in September 1983 and thereafter proved an immensely

important mainspring for the following year's activities. On the first day of each meeting potential developments would be debated and the staff refined them overnight for approval the following morning.

The First Director General and the Standing Committees

Soon after the EngC's formation the search was on for a Director General and Dr Kenneth Miller was appointed on 1 July 1982. Dr Miller had followed a distinguished industrial career, first at ICI and then as Managing Director of APV. He also had an interest in engineering education and was an industrial member of the University Grants Committee (UGC). Although it transpired that Dr Miller was a tower of strength in his post, there was, on his appointment at least one member of Council who thought it unethical for him to be appointed while a member of the UGC which "had decimated engineering education at the former Colleges of Advanced Technology".

The fact that both the Chairman and the Director General hailed from industry was no coincidence. It was a tangible expression of the fact that the EngC was intended to be about industry and the economy, and was not to be dominated by institutional or academic interests, important though these were to the EngC. In fact *all* the chairmen successively Corfield, Tombs, Barlow, Fairclough, Rudge and Hawley were industrialists (though some felt Hawley too academic - see Chapter 7) and *all* the Directors General – Miller, Filer, Heath and Shirley came either from industry or the Services. Academics and Institution members served the EngC with great distinction on the Council and its committees or as Directors or Executives, but never in the two top jobs.

During 1982 three Standing Committees and other advisory and supporting committees were created:

- a Standing Committee on Education and Training (SCET) chaired by Geoffrey Hall, Director of Brighton Polytechnic, advised by a General Education (ie schools) Committee and by a Continuing Education and Training Committee.

- a Standing Committee on Industry (SCI) chaired by Geoffrey Drain, General Secretary of NALGO, until his retirement in December 1983 when he was succeeded by Robert Malpas.

- a Standing Committee on Professional Institutions (SCPI) chaired by Professor Gordon Beveridge who held a Chair at Strathclyde University and who in 1986 became Vice Chancellor of Queen's University, Belfast. This committee was responsible for the important interface between the EngC and the Engineering Institutions including monitoring the standards of accredited degree courses and other courses in engineering.

- a Finance and General Purposes (F&GP) Committee, chaired by Council member Ralph Quartano, Chief Executive of the Post Office Staff Superannuation Fund, and a member of Britoil's Board.

- an Ad Hoc Committee on Technology and Product Design, chaired by Council member Derek Roberts, Director of Research at General Electric Company.

The above are depicted in Fig.2 which additionally shows some sub-committees that we shall refer to later.

Approximately six Council members sat on each of the Standing Committees, the remaining participants on the committees being co-opted non-Council members.

The Chairman of each of these committees (supported by the respective EngC staff Directors yet to be appointed) had key roles to play in establishing core activities and putting the EngC on the map - but the takeover of various functions from the CEI had still to be arranged.

A lean organisation of some 30 staff was envisaged but in the event this proved to be unrealistic in terms of the scale of the work. However, some staff were supported by project funds rather than from the annual fees paid by the Registrants.

The Transfer from the CEI

The EngC's first Policy Statement was used as the basis of the case for taking over from the CEI the awarding of the Chartered Engineer (CEng), Technician Engineer (TEng) and Engineering Technician (EngTech) qualifications, and organising other activities such as the CEI examination. To ensure that the interests of individual members of the engineering Institutions were served, a joint CEI/ EngC Institutions' Working Party was set up to consider the implications of the Policy Statement.

During 1982 the CEI continued to organise the examinations, taken annually by some 1,000 UK and 3,500 overseas candidates (see later in this chapter and also Chapter 6). The CEI also continued to prepare a biennial survey of Chartered Engineers and Technician Engineers regarding their careers, salaries, qualifications and trades union membership - although the results that appeared in October 1983 were actually published at £15 by the EngC. At the same time the Charter required the EngC to maintain a register, with addresses of these engineers and also of Engineering Technicians, whereas the CEI held no central register of personal details – these were held only by the Institutions. Consequently, arrangements had to be set in train to enable a transfer of data from both the CEI and the Institutions to the new EngC. This was a rather daunting prospect as the CEI Register was not computerised but consisted of an individual card for each of some 300,000 Registrants.

Professor Gordon Beveridge, together with Dr Miller, played a leading role at this time in sensitive negotiations with Gerald Mortimer the Chairman of the CEI and Denys Wood its Executive Secretary. The CEI was in fact divided three ways on the issue. There were those who like Gordon Dawson, a past IMechE president, were strongly in favour of the EngC as a logical development which Institutions should accept, there were also those who were against any change and wanted to retain the CEI, and there were yet others who still wanted to settle for nothing less than the Finniston statutory authority. Gerald Mortimer was statesmanlike and determined to do the best for the profession. Help and support came also from an unexpected quarter: John Sampson, Secretary of the United Kingdom Association of Professional Engineers (UKAPE) was also an elected member of the CEI. Sampson had invited Miller to be a guest at the UKAPE annual delegate conference on 26 September 1982, a few days before the release of the EngC's Policy Statement. Dr Miller took this opportunity to assure the delegates in the committees that CEngs would not be swamped by TEngs and EngTechs; he mentioned that the same ratio as in the CEI of two-thirds Chartered Engineers

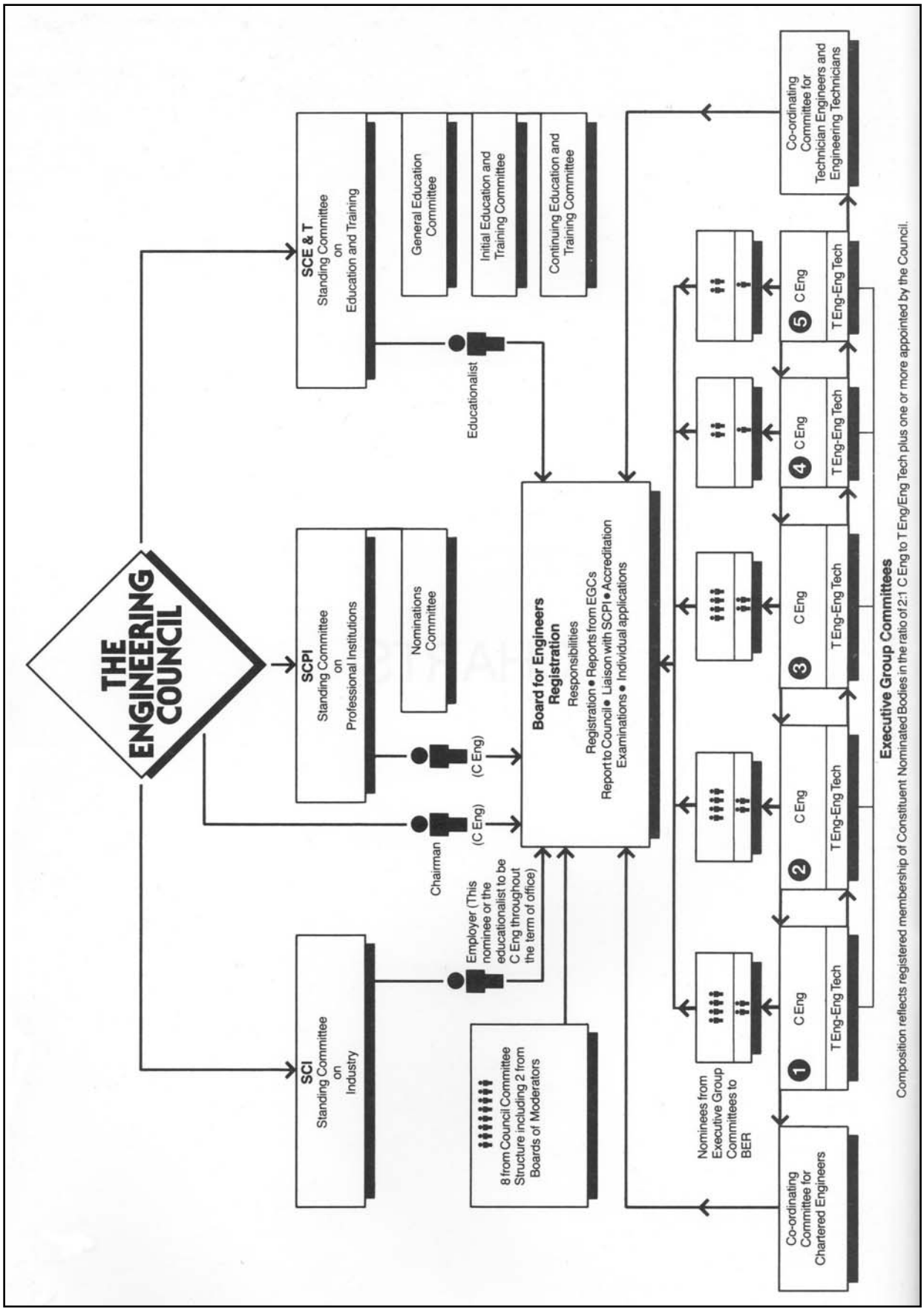

Fig. 2 The Engineering Council Standing Committees and Stucture of Board for Engineers' Registration Committees

would continue within the EngC to make up the new committees through which the profession would be regulated.

A few weeks later, on 11 November 1982, John Sampson invited Kenneth Miller to meet the elected members of the CEI Board on the morning of the very day they were to debate and decide whether to agree the transfer of the CEI's examination and regulatory powers to the EngC.

At that pre-meeting of the elected representatives of the CEI Board, Dr Miller found that the main cause of concern was the non-elected nature of the Engineering Council. He immediately agreed to hold another meeting with the CEI elected members for a full discussion about the formation of an *elected* Engineering Assembly specifically to offer "grassroots" advice to the EngC. This undertaking appears to have swayed a few votes, sufficient later during that day for the CEI Board to approve by 25 votes to 10 the special resolution to surrender its powers to the Engineering Council. As a two-thirds majority was necessary, this was an extremely close run thing! The CEI vote significantly stipulated that the resolution be ratified by a ballot of its registered Chartered Engineers, again a two-thirds majority of those voting being required. To prepare for this referendum a joint CEI/EngC Institutions' Working Party organised 20 meetings held up and down the country during 1982. This group informed and obtained the wishes of individual Chartered Engineers by means of presentations and question and answer sessions.

Because of the lack of a CEI central database the ballot papers had to be sent out by the Engineering Institutions, an arrangement causing organisational difficulties and unwanted delays. Eventually though, the poll of Chartered Engineers was completed in February 1983 revealing that 42% of the 200,000 Chartered Engineers had voted and that 92.2 % of the votes cast (76,274) approved the transfer of the Registers, and the authority to award CEng, from the CEI to the EngC. As a result, on 15 September 1983, the survey activities and the examination were transferred from the CEI to the EngC which then began to establish and operate the more complete computer-based Register and generate an independent income from registration fees and from the sales of publications.

Establishing the Engineering Council

As Dr Miller was taking up the post as Director General he happened to be reading the book *The English Culture and the Decline of the Industrial Spirit 1850-1980* by Martin Wiener of Rice University, USA. Miller was convinced by Wiener's argument that the decline of British engineering and its industrial performance was deeply rooted in its history and, in particular, in the development of its education system since the mid-19th Century. To Dr Miller's mind a major change was required in British social and political thinking. He was determined that the EngC should have as one of its main targets the improvement of education of engineers and the better appreciation by industry, politicians and general public of the contributions that engineers make to the country's prosperity. He knew that it would take decades to bring about these changes, but Wiener's book, as well as the Finniston Report, remained the spirit behind many of the Council's early initiatives.

Following Dr. Miller's engagement as Director General and the appointment of the estimable Betty Hatton as his PA, the search began to recruit key members of the management team, and in particular the four Directors who would support and coordinate the activities of the

Standing Committees for Education, Industry, Professional Institutions and Finance. A Director for Public Affairs was also required.

John Carlill, recently retired Admiral President of the Royal Naval College, Greenwich, was appointed Secretary to the EngC and later (31 March 1983) given responsibility for finance, while Anthony Bond was seconded from the DTI to be Director of Education and Training.

Professor Jack Levy, Head of Mechanical and Manufacturing Engineering at the City University, London, was at his desk late one afternoon when a telephone call came from a head-hunter enquiring if he knew of anyone who might be interested in the post of Director, Professional Institutions at the new EngC. A day or two later Jack, who had been chairman of the CEI's Chartered Engineer Section Board, was invited to dinner with Dr. Miller and Professor Beveridge who was by now chairman of the Standing Committee on Professional Institutions. At that meeting the main lines for the committee structure involving the Engineering Institutions – for what became the Board for Engineers Registration (BER), its five Executive Group Committees and its two co-ordinating committees [see Fig.2] - were hammered out with the aid of drawings on a table napkin. Professor Levy became a consultant to the EngC in December 1982 and full-time Director, Professional Institutions in June 1983. From then on the two professors, Beveridge and Levy worked together extremely closely on the development of engineering education and training in consultation with the Institutions.

Graham Anthony, an industrial engineer, with extensive experience in the UK and overseas, was appointed Director, Industry in May 1983 while Ron Kirby, who had held several senior newspaper editorial and management positions in the Thomson Organisation and in public relations in the Sime Darby international industrial group, replied to an advertisement for the post of Director, Public Affairs. But before he could be interviewed Ron Kirby was injured by a hit-and-run driver and hospitalised; he was visited in bed by the head-hunter and then offered the job which he began, on crutches, also in May 1983. And so by mid-1983 the team of Directors was fully in place ready for the main effort to begin. Weekly meetings between the Director General and the Directors' team encouraged close coordination of their efforts and initiatives.

Because the EngC had been established as a non-profit making Chartered body, an early decision was taken that it should operate as a Registered Charity, reflecting its purposes and incidentally enjoying tax concessions and other financial advantages. Application was made to the Charity Commission and in January 1983 the EngC gained charitable status. However, this was not without its complications, because when sales of EngC-related items later became significant, a separate trading company had to be created for the EngC to retain its charitable position.

While the activities of committees expanded, so did the demand for EngC staff to support and facilitate the publishing and publicising of committee proposals and reports. Further full-time staff joined the team and by 31 March 1983 the EngC had 20 staff members some of whom had transferred, after interviews, from the CEI. In particular, Helena (always called Ena) Duffley, an unparalleled expert on engineering qualifications, and Brian Millicent, responsible for the CEI examinations, joined the Professional Institutions Directorate. Bob Bish who had run the CEI Register took over the same responsibility at the EngC with the title of Registration Executive. Dr Arthur Osley, a retired civil servant with wide experience, came over to continue as the secretary for international contacts.

To benefit the staff in the EngC's four Directorates, a Pension Scheme was set up on 30 September 1983 to provide retirement and death benefits for them; the scheme received approval from the Occupational Pensions Board on 26 January 1984 and from the Inland Revenue on 14 February 1984.

Additional staff, in turn, enabled the EngC's framework of activities to be strengthened. An Initial Education and Training Committee (for further and higher education) was created alongside the two committees set up in 1982 to advise the Standing Committee on Education and Training.

Now the structure of the Standing Committee on Professional Institutions (SCPI) was developed as shown in Fig.2. Two significant bodies reporting to it were established:

- A Nominations Committee, chaired by Professor Beveridge himself to assess professional engineering Institutions wishing to become 'Nominated' and 'Authorised' Bodies of the EngC. A 'Nominated' Body was defined as a professional engineering Institution recognised by the EngC to propose individuals for the CEng, TEng or EngTech title. An 'Authorised' Body was recognised as being able to accredit education courses, and approve training programmes and arrangements for experience - the three stages leading to the CEng, TEng, and EngTech titles. This system of Nominated and Authorised Bodies and the standards required of Registrants is elaborated in Chapter 3 under 'SARTOR'.

- The Board for Engineers' Registration (BER), chaired with great distinction until May 1986, by Professor Bernard Crossland. The BER, which comprised representatives from five Executive Group Committees (EGCs, described later in this Chapter), acted as a think-tank and a coordinating body between Council and committees and working groups - these were addressing issues relating to regulation and registration of Chartered Engineers and Technician Engineers - and hence relating also to examinations.

Further important tasks for 1983 were to produce Bye-Laws to underpin and expound upon the EngC Royal Charter and then to secure their approval by Her Majesty's Privy Council. A small working party was established early in the year to carry out this work. Professor Gordon Beveridge again played an important part helped by Jack Levy and Michael Leonard, the Secretary of the Fellowship of Engineering; Michael Leonard had previously been Secretary of the CEI and with his knowledgeable background of the CEI Charter was a great asset. The result was a set of Bye-Laws which clarified and strengthened the role of the EngC. For example, although members of the Executive Group Committees (EGCs) were *representatives* of their Institutions, as attendees at EGC meetings, when any of them then sat on the superior BER body, the bye-laws required them to speak for their EGC, not necessarily for their own Institution, and put forward views agreed by all Institutions within that EGC. Interestingly, a clause was proposed for the Bye-Laws that would have given the EngC authority to charge an Institution for being a Nominated Body. Gordon Beveridge was very keen on this and the concept was included in the first draft. However, the Clerk to the Privy Council made it clear that if, as was likely, Institutions objected to this, the Privy Council would almost certainly uphold their objections. The working party reported this back to Council which wisely deleted the offending clause. So the Bye-Laws were approved by the Privy Council on 25 November 1983 and new Regulations, to fill out detail relating to the Bye-Laws and Charter, were drafted during the following year.

Dr Miller later pointed to two key provisions at this time:

> "1. We insisted on having the addresses of all registrants, so that we could communicate with them - and we did so with a six-monthly newsletter.
>
> 2. We insisted that the Engineering Council set the level of annual registration fees for individuals who would have the right to use the CEng, TEng and EngTech titles. For administrative convenience the Institutions collected the fees for us, but it was made clear that this was as our agents, and if need be we would be prepared to collect the fees direct, but at greater expense to the profession. From then onward these registration fees provided a major stream of finance for the EngC".

By the end of 1983 the EngC had 29 permanent members of staff plus three secondees from Government Departments working at Canberra House, 10-16 Maltravers Street in central London. The office address, surely now engrained in every registered engineer's mind, was later simplified to 10 Maltravers Street. The 32 staff members were able to cope with the large number of projects and massive volume of work (the word initiatives was not in vogue in the early 1980s) by utilising "modern office technology" – to quote from the first Annual Report; although in practice this meant electrically operated golf-ball typewriters and telex machines. Word processors, let alone personal computers, and e-mails had not even been heard of at this time and facsimile (fax) machines were in their infancy.

In 1984 Tony Bond, the Director of Education and Training, returned to the DTI and the functions of the Education and Training Directorate were split and allocated to the Directorate – Professional Institutions and the Directorate – Industry. The former was renamed the Engineering Profession Directorate and absorbed the Higher Education and Training function, enabling the existing links between the Engineering Institutions and universities/colleges to be further strengthened. The Directorate – Industry absorbed the continuing education and training function for all engineers and also the schools' liaison activity, so promoting the links between industry and schools. The two enlarged directorates remained under the leadership of Professor Jack Levy and Graham Anthony respectively.

To encourage the EngC's Council to become more representative of the professional Institutions and their individual members, a system and timetable had been negotiated whereby the Government would slowly withdraw its direct influence (and, incidentally, its funding). Accordingly, on 24 November 1984 the Secretary of State for Trade and Industry ceased to have authority to appoint members to Council; from this time members were appointed from those nominated from an agreed "List and Schedule". The List contained the names of those Chartered Engineers nominated by organisations of employers, educational institutions and Nominated Chartered Engineering Institutions; the Schedule contained the names of individuals of standing drawn from professions other than engineering - for example but not exclusively, trades unions, education, industry and public life. The List and Schedule were created at the end of 1984 from the names of those submitted by a wide range of individuals and organisations in accordance with the Bye-Laws and Regulations.

The Chairman, Sir Kenneth Corfield, had originally been appointed until 31 December 1984. However, in November 1984, to meet the requirements of the EngC's financial and business year ending on 31 December and to accommodate the time needed to prepare and finalise reports and accounts for an Annual Report presented to a General Meeting in the following May, Sir Kenneth agreed to have his term extended (along with the terms of offices of all

members of Council) to the conclusion of the AGM on 1 May 1985 when the third annual report and accounts were published. Thereafter the EngC's annual reports and accounts were made available every 1 May.

Interfacing with the Institutions

All 53 Professional Institutions in the CEI's registration structure joined the EngC's registration system, meeting within five clusters for the first time in April 1983, under the extremely broad engineering areas of mechanical, civil, electrical, process and transport. These clusters, or groups as they were termed in the 1980s, soon became the five Executive Group Committees (EGCs) [see Fig.2]. The EngC's official Initial List of the 53 Nominated Bodies and their clustering was published in November 1983, just inside the two-year deadline set in the Charter; this list is reproduced in Annex D. Terms such as Nominated Body and Authorised Body and clarification of Chartered Engineer, Technician Engineer and Engineering Technician were not formally published until November 1985. We shall discuss these in Chapter 3.

During 1984 panels of representatives from the Nominations Committee [see Fig.2], itself composed of Institution Nominees, began their rounds of visiting the Professional Institutions to assess their applications to become Nominated Bodies of the EngC under new agreed criteria. 25 Institutions were visited, another 22 submitted full applications and awaited panel visits while two pairs of the original 53 Institutions merged – the Institution of Municipal Engineers with the Institution of Civil Engineers and the Institution of Metallurgical Technicians with the Institution of Metallurgists. A further seven organisations, not in the old CEI, applied to become Nominated Bodies in 1984. The Nominations Committee was responsible for regularly monitoring Institutions' procedures and practices, so protecting the interests of individual engineers nominated to all sections of the EngC's Register. Merging, clustering and grouping of Institutions were encouraged with considerable success throughout the life of the EngC where this was perceived to be in the best interests of the engineers and the profession as a whole.

The relationship between the EngC and the Engineering Institutions was always a determining factor in the fulfilment of the EngC's aims as embodied in its Royal Charter. A kind of federal system operated with the EngC at the hub and the Institutions at the rim. In such systems ambivalencies and tensions always exist – witness the European Union, though unlike the European Union system the Institutions had no *representatives* on the EngC's Council making the relationship, in some respects, even more challenging.

Be that as it may, during the lengthy negotiations that led to the establishment of the EngC, the Institutions were often helpful. They co-operated in agreeing to collect the EngC fees from Registrants together with their own subscriptions and forward them in bulk to the EngC. They were also deeply and constructively involved in the development and operation of new standards of education and training. They also agreed to a compromise when establishing the British National Committee for International Engineering Affairs (see later). At other times the Institutions were neutral or even obstructive when they felt that their own activities or positions were being eroded. And so it was ever after.

It is noteworthy that the Secretaries of the four large Institutions were generally supportive at this phase of development without surrendering their own basic interests. These Secretaries were John Mckenzie (ICE), Alex McKay (IMechE), Howard Losty (IEE) and Dr Trevor

Evans (IChemE). However, such larger and longer-established Institutions often professed scepticism of the ability of the EngC to make more progress than they could themselves. They were always conscious that a small number of them, perhaps a few as six, had about 90% of the total Chartered Engineer members yet had no direct representation on the Council of the EngC.

To some extent there was here a difference in attitude between the smaller and larger Institutions. The smaller, many of which were concerned mainly with TEngs and EngTechs rather than CEngs, generally welcomed the opportunity to belong to a strong national organisation. This quotation from one of them is fairly typical: "We look to the Engineering Council to set and promote the agenda for the future success of engineering in society and to provide a global benchmark for both setting standards and for the discipline of the individual member".

In these circumstances it was always recognised that the best possible communication arrangements between the EngC and the Institutions would be extremely beneficial. Thus regular meetings were arranged with the Secretaries and Presidents of all the Institutions, including a special set of meetings with the largest. No doubt there were faults in communication and attitude on both sides but it is apparent from the record that so far as the EngC was concerned every effort was made to explain, develop and improve the relationship. One difficulty that emerged, and persisted, was that in most Institutions the President changed annually and entered office with only a superficial knowledge of the EngC's aims. Most Presidents were, therefore, on a steep learning curve and naturally much influenced by the views of their Secretaries. It is notable that those who previously or subsequently became involved as members of the Council, or of one of its major committees, were much more sympathetic and enthusiastic towards the Engineering Council. So much so in fact that on more than one occasion they were accused by their own Institutions of 'going native'. We will return in later chapters to this theme, and the ways in which relationships subsequently developed during the life of the EngC.

Interfacing with the Registrants

The Regional Organisations (ECROs)

Following Dr Miller's meeting in November 1982 with the elected representatives of the CEI Board, he had developed the idea of addressing the needs of individual engineers throughout the country. He suggested establishing an elected Engineering Assembly that could meet at least annually and have regional committees to encourage local activities and provide a two-way flow of communication between the EngC and its grassroots. The EngC Charter had no specific provision for directly-elected representatives but Dr Miller met elected CEI Board members again in January 1983 to consider this concept. Subsequently, a consultative document "The Engineering Assembly and Regional Structure" was published by the EngC in June 1983. This resulted in an interim structure of Engineering Regional Organisations (EROs) in nineteen regions being established under the auspices of several of the Chartered Engineering Institutions, so bringing together, in each region, registrants in all branches of engineering. At a joint meeting of the EROs in June 1984 the consultative document was discussed and a policy statement published, leading to elections in the Spring of 1985. In each of the 19 regional constituencies the registered engineers elected four Chartered Engineers and two Technician Engineers.

The creation of the Regional Organisations and of the annual Engineering Assembly (this finally took place later in 1985, as we shall see in Chapter 3) was considered as a vital link in establishing the ownership that individual engineers could feel for the Engineering Council. It had always to be borne in mind that Registrants' Fees (£3 for CEng £2 for TEng and £1for EngTech in 1984) accounted for a substantial part of EngC income.

The Register and Communications

The first publication to be sold by the EngC, thereby recovering some of its operating costs, if not generating a remarkable income, was "The 1983 Survey of Professional Engineers", taken over from the CEI and made available in September 1983 for £15. This was the ninth biennial survey undertaken of Chartered Engineers and the fourth of Technician Engineers. The survey was conducted by Remuneration Economics of Surrey, on behalf of the CEI and the EngC. This publication illustrated that the earnings of qualified engineers had kept pace with inflation and that their unemployment level was considerably lower than the national average.

On 31 December 1984 the EngC's Register, now on a Wang computer with an "Ultimate" database capable of providing data in various classifications and formats, contained 281,500 registrants comprising 202,000 Chartered Engineers, 61,000 Technician Engineers and 18,500 Engineering Technicians. The great majority of these had transferred from the old CEI system, though some had joined Institutions that were not part of the CEI but had subsequently become an integral part of the EngC. But now all registrants had a secure "home" that significantly recorded their addresses on centrally-held lists thanks to the sterling efforts of Bob Bish, Registration Executive and Brian Senior, Deputy Director, Professional Institutions. Remarkably enough for a new computer system, the installation and operation were virtually fault-free thanks to the careful selection of a contractor. The numbers of Registrants, together with some leading financial data over succeeding years, are tabulated in Fig. 3. Fig. 3a shows total registration numbers while Fig. 3b shows the numbers of Registrants per Institution. Fig. 3c gives an annual sequence of income and expenditure.

The completion of the Register enabled the first issue of the EngC's *Newsletter* to be published and distributed in April 1985 to all Registrants. The headline "Forward We Go Together" was expanded by Kenneth Miller in an article by him on the front page, anticipating the first meeting of the elected Engineering Assembly to be held that September. It is difficult now for us to visualise the methods employed in the mid-1980s to record and maintain even sparse data on individuals, and prepare simple labels with mere names and addresses. But such mundane tasks for over 280,000 registered engineers and technicians were regarded as an achievement in those times and the distribution of Newsletter No 1 was possible only by virtue of the new Register and the EngC's innovative systems.

Interfacing with Schools

The Council was very conscious that changing the public's attitude to engineers would only effectively come about by changes in the education of the nation's children and this, of necessity, would be a long term task measured in decades, not just a few years. Michael Harrison, a retired Chief Education Officer from Sheffield, was a central figure for the Council on the schools' front, chairing the General Education Committee and using to advantage his encyclopaedic knowledge of the UK school system.

REGISTRANTS PER INSTITUTION

	Total Number of Registrants				Total Number of Memberships			
As At	CEng	IEng	EngTech	Total	CEng	IEng	EngTech	Total
31.12.84	201407	60606	18232	280245	221786	61007	18347	301140
31.12.85	202722	60695	18317	281734	221652	60414	17617	299683
31.12.86	196294	58822	17087	272203	218536	60006	17159	295701
31.12.87	196920	59205	17034	273159	219054	60618	17091	296763
31.12.88	199583	56065	17005	272653	222126	58166	17208	297500
31.12.89	195469	55645	16703	267817	217568	57700	16899	292167
31.12.90	200447	55686	16342	272475	225749	57783	16515	300047
31.12.91	198326	56004	16205	270535	223226	58340	16462	298028
31.12.92	199158	56520	16466	272144	224228	59168	16755	300151
31.12.93	197375	55004	15565	267944	222068	57517	15836	295421
31.12.94	197426	54075	15716	267217	218447	56311	15969	290727
31.12.95	198103	53251	15794	267148	218518	55413	16046	289977
31.12.96	198469	52140	15785	266394	219046	54390	16036	289472
31.12.97	197414	51109	15476	263999	219340	53703	15840	288883
31.12.98	196948	49975	15267	262190	220760	53059	15672	289491
31.12.99	196131	50083	15085	261299	218193	51938	15254	285385
31.12.00	195103	48799	13266	257168	216659	50474	13376	280509
31.12.01	195427	49252	13454	258133	216235	52887	13560	282682

As At	New Final/Stage3 Registrants				Total Female Registrants - Interim and Final/Stages 1 & 3			
	CEng	IEng	EngTech	Total	CEng	IEng	EngTech	Total
31.12.84	3911	2391	1002	7304	563	18	4	585
31.12.85	5002	2774	1337	9113	637	68	28	733
31.12.86	5960	2682	1039	9681	685	73	33	791
31.12.87	6022	3066	1130	10218	806	94	35	935
31.12.88	5878	2281	1159	9318	1108	113	45	1266
31.12.89	4746	2335	1210	8291	1354	139	50	1543
31.12.90	9207	2559	1315	13081	2013	176	57	2246
31.12.91	5413	2634	1185	9232	2377	243	67	2687
31.12.92	5588	2128	1184	8900	2758	266	79	3103
31.12.93	6159	2050	1190	9399	3077	267	84	3428
31.12.94	5721	1556	1237	8514	3484	288	98	3870
31.12.95	5376	1433	1146	7955	3776	303	123	4202
31.12.96	5486	1579	1052	8117	4125	345	135	4605
31.12.97	5641	1595	903	8139	4499	369	153	5021
31.12.98	4792	1484	789	7065	4764	396	160	5320
31.12.99	5157	1562	916	7635	5118	437	173	5728
31.12.00	5096	1708	683	7487	5426	470	145	6041
31.12.01	4932	1362	592	6886	5716	502	150	6368

	Losses by	New Female Registrants 2001			
	Other	508	42	9	559

As At	Total Interim/Stage 1 Registrants				Losses			
	CEng	IEng	EngTech	Total	CEng	IEng	EngTech	Total
31.12.84					3548	2631	1381	7560
31.12.85					5791	3086	1486	10363
31.12.86					5445	3924	1361	10730
31.12.87	151	182	11	344	6103	2952	1168	10223
31.12.88	6537	692	140	7369	3898	5754	1342	10994
31.12.89	11043	1255	246	12544	9421	3051	1861	14333
31.12.90	13630	1784	305	15719	4923	2986	1850	9759
31.12.91	16449	2955	442	19846	8227	2970	1432	12629
31.12.92	17965	3317	526	21808	5489	1892	1024	8405
31.12.93	18637	3303	497	22437	8080	3606	2106	13792
31.12.94	18599	3085	462	22146	5778	2515	1106	9399
31.12.95	18778	3092	476	22346	4832	2292	1076	8200
31.12.96	18984	3270	553	22807	5120	2690	1061	8871
31.12.97	18614	3307	570	22491	6696	2626	1212	10534
31.12.98	18489	3287	563	22339	5258	2618	998	8874
31.12.99	18165	3482	611	22258	5974	1454	1098	8526
31.12.00	17756	3112	550	21418	6124	2992	2502	11618
31.12.01	16895	3548	611	21054	4608	909	404	5921

Losses by	New /Interim/Stage 1 Registrants 2001							
Death					867	78	11	956
Other	906	483	86	1475	3741	831	393	4965

Fig. 3(a) Registration Statistics 1984 -2001

Institution	Interim CEng	Final CEng	Interim IEng	Final IEng	Interim EngTech	Final EngTech	TOTAL
ICE	0	40686	158	3258	10	531	44643
IMechE	3956	41011					44967
RINA	11	2207	1	168	0	41	2428
IGEM	0	2178	2	647	0	201	3028
RAeS	4	4770	0	1582	0	569	6925
IoM	288	5553	3	625	0	55	6524
IEE	10305	51225	2	1552	0	15	63099
InstPhys	0	576					576
IIE			2263	21271	543	5838	29915
IMarEST	322	6591	5	2779	5	382	10084
IMM	63	3494	3	630	0	103	4293
CIWEM	191	544	2	519	0	17	1273
CIBSE	855	4183	25	1569	0	629	7261
ICME	30	70	45	151	8	35	339
InstPlumb			0	137	0	1317	1454
IStructE	87	10056	0	1337			11480
IRSE			0	9	0	4	13
IFE	13	76	0	11	0	4	104
IChemE	0	9997	0	87			10084
ILE	2	56	5	379	0	74	516
TWI	3	244	7	266	0	213	733
InstE	93	2162	10	169	0	2	2436
IAgrE	83	169	63	343	13	94	765
IHEEM	30	122	15	747	0	146	1060
InstMC	143	1052	0	828	0	84	2107
IED	75	227	78	1808	5	234	2427
SOE	9	147	111	4310	15	2166	6758
IWO			18	400	5	42	465
BInstNDT	0	74	0	423	0	251	748
BCS	62	7489	0	184			7735
INucE	7	248	0	189	0	11	455
SEE	0	1	0	2	0	0	3
IPEM	1	51	0	10	0	1	63
ACostE	7	45	1	20			73
IHIE			690	1527	7	248	2472
IOA	86	122	9	17			234
*IQA			0	968	0	93	1061
*ISME			0	17	0	8	25
*MES			0	39	0	38	77
*IAEA			0	67			67
Direct	0	1	9	207	0	8	225
TOTAL	**16726**	**195427**	**3525**	**49252**	**611**	**13454**	**278995**
FEMALE	1137	4580	141	362	13	142	6375
Female %	6.80	2.34	4.00	0.73	2.13	1.06	2.28
* Not a Current Nominated Body							

(Registrants are shown according to the Institution to which they pay their EngC fee)

Fig. 3(b) Registration Statistics 2001

Year	Total Gross Income* £000	Total Operating Costs £000
1982	565 [1]	358
1983	1,021 [2]	1,101
1984	2,052 [3]	2,052
1985	1,631	2,027
1986	2,774	2,602
1987	2,863	2,772
1988	3,127	3,187
1989	3,497	3,676
1990	4,257	4,483
1991	4,656	4,750

Year	Total Gross Income† £000	Total Operating Costs £000
1992	6,023 [4]	5,497
1993	6,579 [5]	6,634
1994	7,014 [6]	6,819
1995	7,183 [7]	7,215
1996	7,110	7,532
1997	5,817	5,524
1998	6,164	5,433
1999	6,358	5,601
2000	6,418	5,717

* Income from activities such as identified in the table below for the sample years, 1983, 1985, 1998, 1991.
† Income from all sources.
[1] Includes £550,000 as grant-in-aid from the Government.
[2] Includes £917,000 as grant-in-aid from the Government.
[3] Includes £859,000 as grant-in-aid from the Government.
[4] Includes sums from investments and realisation of some assets. Income from activities only was £5,755,000.
[5] Includes £194,000 from investments. Income from activities only was £6,385,000.
[6] Includes sums from investments and realisation of some assets. Income from activities only was £6,645,000.
[7] As in 1994 and for subsequent years, this includes all sources of income. Income from activities only was £6,878,000 for 1995.

Source of Income	Year 1983 £000	Year 1985 £000	Year 1988 £000	Year 1991 £000
EngC Registration Fees	0.6	763	1,805	2,778
Examinations	-	-	394	348
Industry Affiliates	-	171	512	513
YEB Competition	99.4	105	88	123
National Eng Scholarships	-	99	17	-
Sales of Publications	4	63	66	103
Prince of Wales Award	-	29	42	-
Other Projects (WISE etc)	-	6	248	629
Eur Ing Registrations	-	-	-	16
Miscellaneous	-	1	1	69

Fig. 3(c) Financial situation over the years of operation of the Engineering Council, taken from the EngC Annual Reports. (Details of activities were not given after 1991.)

Much valuable work was done at this time advising Government officials on the revision of the school curriculum. The creation of the 'National Curriculum with Technology' was an important development, and proved reasonably successful. However, pressure groups in schools diverted a lot of this money to Domestic Science, largely because it was politically convenient to include this activity within Technology. The broader treatment of engineering and technology in schools was, and remained, seriously hampered by a shortage of capable technology teachers.

Women into Science and Engineering (WISE)

Two innovative projects, WISE and YEB, begun in 1983, became increasingly popular and successful throughout the rest of the EngC's daily life. The first project, Women Into Science and Engineering (WISE) entailed publicising and promoting in schools, further and higher education establishments, industry and professional Institutions, career opportunities available to girls and women in science and engineering. Council member Beryl Platt had become Chairman of the Equal Opportunities Commission, and was a tower of strength in promoting the WISE project making 1984 WISE year and the EngC, with her support, persuaded industrialists to sponsor WISE buses (travelling exhibition visits that could also be used for teaching small classes). The first WISE bus was launched by Margaret Thatcher from Downing Street. At this time women constituted 7% of the students on engineering courses at universities and polytechnics. The WISE buses were maintained initially by Trent Polytechnic, which continued to care for them after it became Nottingham Trent University in 1990. Beryl Platt was also instrumental in raising the matter of Career Breaks which led to a working party and an EngC policy statement in December 1985. All these activities successfully encouraged more girls to take up a career in Engineering.

In connection with the WISE project, Loughborough University was commissioned by the EngC to conduct a survey in schools on examples of good practice in encouraging girls and women to consider engineering careers; the results of this survey were delivered during 1983. The campaign was publicly launched at a press conference in 1984 with over 200 media representatives. Several hundred local events followed and a WISE bus containing promotional displays and materials, financed by industry, went on tour. During these and subsequent years the WISE campaign continued to be energetically driven by the EngC Executive, Marie-Noëlle Barton.

Young Engineer for Britain (YEB) Competition

The Engineering Council inherited "The Young Engineer for Britain Competition" from the CEI and every year it continued to provide a high profile occasion enabling the imaginative ideas of young British school children to be demonstrated in the artefacts they designed and made. Dr Miller said "During my time at the Engineering Council it was always one of the most enjoyable days of the year to visit the various schools' stands and see the enthusiasm of the youngsters."

Both WISE and the YEB competition continued to flourish over subsequent years under the EngC's mantle. Indeed, in 1999 the YEB competition was extended to include Junior Engineer for Britain. We shall describe some of the progress highlights of these two activities in later chapters.

Other Schools' Activities

The Standing Conference on Schools Science and Technology was commissioned to study "problem-solving in science and technology" for younger school children, and Hatfield Polytechnic carried out a survey of behalf of the EngC on "Young People's Attitudes towards Engineering Careers". Its report, in the form of a discussion document, was published in June 1984 and made available at £10 a copy. In addition, the EngC initiated two projects associated with the shortage of technicians in certain branches of engineering: the introduction of courses in Information Technology and the introduction of short courses in Computer Aided Design and Manufacture. The requirements for management and business skills by engineers as their careers develop were also considered.

Also during 1983, the EngC took an active role in the "Prince of Wales Award for Industrial Innovation and Production"; Sir Monty Finniston launched an appeal to set up a Trust Fund to provide a wider range of prizes for this award. The responses were an overwhelming success contributing to both awards and administrative costs thereby enabling this Award to continually flourish as another annual event in the EngC's calendar; indeed, so much so that His Royal Highness took a personal interest in the Award over subsequent years, even attending a meeting of its steering committee in 1984.

At a seminar organised by the EngC for Chief Education Officers in March 1985 to explain its policies and activities, John Butcher MP, Parliamentary Under Secretary of State for Industry, gave the keynote speech. The Chair was taken by Lord Gregson, Chairman of the House of Lords Select Committee on Science and Technology. As a result of this, and the activities of the General Education Committee led by Michael Harrison, closer links were developed with the influential Society of Education Officers (SEO).

Further and Higher Education

Standards and Routes to Registration (SARTOR)

As links with industry and with the academic world were forged and developed during 1983, many issues were debated within EngC committees, resulting in the publication of a number of reports. In August a consultative "Statement on Enhanced and Extended Undergraduate Engineering Degree Courses", defined, in broad terms, how courses accredited for the academic requirements for CEng and TEng might develop. Curiously enough the BER and the Institution representatives were cautious about the comprehensive and rather radical approach in this report prepared by Professor Levy. Exceptionally they agreed it could be published by the EngC but over his name rather than as an EngC statement. It was distributed widely to Government Departments, Engineering Institutions, universities and engineering employers.

Following this, in October 1983, a cardinal consultative document "Standards and Routes to Registration (1985 onwards)" was published that was to permeate the EngC's arteries ever after. Based on Professor Levy's original paper, this was a start by the BER towards determining the future standards of education, training and experience for registration either as a professional engineer (this included all Chartered Engineers), a Technician Engineer or an Engineering Technician. 6,000 copies were distributed to industry, Government Departments, Professional Institutions and educational authorities. Having considered comments from a variety of parties, the first edition of SARTOR, as Standards And Routes

To Registration became known, affectionately by some, was issued by the BER as an EngC policy statement at the end of 1984 when it was also made available for public purchase at £8. We shall outline its provisions later, in Chapter 3, as the actions stemming from it took place in 1985/86.

Throughout this period the Standing Committee on Professional Engineers was most ably chaired by Gordon Beveridge. Working with it the BER was chaired by Professor (later Sir) Bernard Crossland who had an estimable knack of defusing any heated situation with a pertinent but humourous remark. The three Professors Beveridge, Crossland and Levy, supported by Brian Senior and Ena Duffley, worked extremely closely to produce the first edition of SARTOR.

Resources for Engineering Education

Various EngC committees were now examining nationwide possibilities of improving existing, or even creating new, engineering courses. A Policy Statement was prepared in February 1984 on "Resources for Engineering Education". This resulted in discussions with the Secretary of State for Education and Science and the University Grants Committee on increasing the 'unit of resource' for engineering students. In the same month a discussion document on "Funding of Accredited Training Places in Engineering" was published and found great favour in academic circles such as the Engineering Professors' Conference (later becoming the Engineering Professors' Council). As a consequence of these efforts the EngC took over from the Department of Education and Science (DES) the National Engineering Scholarships Scheme for students on first degree engineering and related courses. 212 scholarships were awarded for three to five year periods having a total value of £106,000 per year.

The EngC lobbying during 1984 was so effective that when the Chancellor of the Exchequer announced on 19 March 1985 that the Government was to mount a £43 million programme over the next three years for the provision, within higher education institutions, of additional places in engineering and technology, the DES press notice attributed this to be the result of "the advice of The Engineering Council".

The EngC Examination

Until the 1960s each of the Engineering Institutions ran its own examinations for candidates wishing to become members. Often these carried the Ordinary and Higher National Certificate (ONC/HNC) label for which the large Institutions were, at that time, responsible. Broadly speaking, membership of an Institution could be obtained by gaining an HNC and then passing examinations in 'endorsement' subjects also set by the relevant Institution. Most candidates entered by this route having studied on evening or part-time day-release courses. An engineering degree, held by the minority, merely gave exemption from an Institution's own examinations.

In the course of time the National Certificate system was taken over by central Government and coincidentally the academic standard for Chartered Engineer was raised to an engineering degree, i.e. one to two years study beyond HNC. The decreasing numbers entering by each Institution's endorsement subjects gradually made them uneconomic to run. There was a continuing need, however, in the UK and abroad, to provide an alternative degree level route to membership for individuals not able to attend a university.

So when the CEI was formed in 1964 it was decided to meet this academic need by means of a joint examination system that would satisfy the basic needs of all the Chartered Engineering Institutions. Thus the CEI Examination was born and became a considerable success – almost a shining example of collaboration between the Institutions. It catered worldwide for students whose circumstances prevented them from pursuing a recognised degree programme, and also for those who had a qualification that did not fulfil the requirements (e.g. an HNC) and who wished to take further papers to meet the standard. It was also used extensively by students who merely wished to achieve a British engineering qualification that was respected and recognised internationally. This was useful to thousands of overseas candidates whose own national university system had not been sufficiently developed to provide an indigenous qualification. Technically the CEI, and subsequently the EngC, examination was the benchmark for the educational component for the CEng qualification. Accredited engineering degrees simply gave exemption from the examination.

The CEI examination was in two parts, a format continued by the EngC when taking over in 1983. Part 1 was set at a level about one-third of the way to an engineering degree while Part 2 was at engineering degree level (later raised to honours degree level). The requirements for the examinations were continuously developed by the EngC in line with the progressive raising of its standards for education and training and hence Institution membership requirements for CEng, as we shall see in subsequent chapters. Many courses and examination centres were established in the UK and in countries abroad, often in polytechnics or large technical colleges. The CEI papers were set and marked in London by UK boards of examiners and moderators comprising experienced university engineering teachers. Each board of examiners was responsible for a subject or group of subjects and reported to a board of moderators. This board of moderators made final decisions on standards and on candidates' performances. An independent person chaired the board of moderators on which the chairmen of each of the boards of examiners sat. By special arrangement the examination could be taken anywhere in the world if a suitable invigilator was found. In one notable case a lone naval candidate took his papers in a submarine under the polar ice-cap!

This international examination system serving thousands of candidates was run annually every May with a remarkably small number of staff – three or four people under the extremely able direction of Brian Millicent until his untimely death in 2000 and by Chris Harrison and Janet Welch after that. In May 1984 the Part 1 and Part 2 examinations attracted a record 4,863 candidates at 47 centres in the UK and 65 centres overseas. A detailed note of the arrangements in 1998 may be found in Chapter 6.

Continuing Education and Training

To initiate interest in this field a discussion document "Continuing Education and Training" was published by the EngC in March 1985, prompting over 300 replies from a wide range of companies, Government Departments, individuals and other organisations. In subsequent chapters we shall describe the EngC's reaction and increasingly active encouragement of the promotion of Continuing Education and Training (CET), later becoming known as Continuing Professional Development (CPD).

Interfacing Internationally

The British National Committee for International Engineering Affairs (BNCIEA)

In 1983 the EngC joined the Société Européene pour la Formation des Ingénieurs (SEFI), so gaining access to developments in engineering education in other parts of Europe and enabling it to learn about and to communicate the policies of the United Kingdom. The CEI had previously co-ordinated the representation of the British engineering profession overseas and it was assumed that after the vote to disband the CEI the EngC would be asked to continue with this task. However the four Secretaries of the Civil, Mechanical, Electrical and Chemical Engineer Institutions had reservations and suggested that the Institution of Civil Engineers should do this work. When this was reported at the following EngC Council meeting, one of the non-engineering members from industry stated "If this behaviour became public knowledge, the engineering profession would deserve its poor reputation". At his next meeting with the four Secretaries Dr Miller recounted this reaction. Professor Levy proposed a compromise that the new BNCIEA should not be a formal part of the EngC but its Chairman should be a member of the EngC's Council and it would report to the BER on which, as noted previously, the Institutions were well represented. This diplomatic proposal was accepted by the Institutions and so the BNCIEA, even having its own notepaper to emphasise its distinction, was born in 1984. The Committee initially under the chairmanship of James Stevenson (of Balfour Beattie) and later George Adler (Director of the British Hydromechanics Research Association) went on to play a key role in a number of developments, chiefly concerning international recognition of national engineering qualifications.

FEANI, CEC, WFEO

James Stevenson, EngC Council member and the first chairman of the BNCIEA writes: "Perhaps my main contribution to the Engineering Council was through my involvement as its representative on the British National Committee for International Engineering Affairs. This Committee represented British professional engineers by bringing together members from the Engineering Council, the Chartered Engineering Institutions and the Fellowship of Engineering with a co-opted Technician Engineer to interface with like organisations internationally. This was achieved through membership of three international bodies: in Europe through the Fédération Européenne d'Associations Nationales d'Ingénieurs (FEANI), in the Commonwealth through the Commonwealth Engineers' Council (CEC) and worldwide through the World Federation of Engineering Organisations (WFEO). The new BNCIEA was serviced by the Engineering Council with Professor Levy as Secretary and a very able Assistant Secretary in Dr Arthur Osley. I should like to say here that they provided the Committee Chairman with a constant stream of well-conceived and helpful advice which went well beyond the normal role or call of duty of any secretariat. When I accepted the Chair of BNCIEA I was quite unaware of the problems that lay ahead.

"The first problem was soon revealed - that of the argued position of the CEng qualification on the FEANI Professional Engineers Register, used to give recognition to qualified engineers in Europe and in some overseas countries, notably in the Middle East. For years the previous British National Committee run by the CEI had tried to reach agreement with FEANI on the CEng qualification; however, a stumbling block had been that FEANI had been unable to accept that the British three-year academic engineering degree could be equivalent to the European four and five-year degree courses, which at that time formed the

basis of FEANI registration. The problem had been temporarily resolved in 1981 by agreeing a five-year moratorium on allowing British Chartered Engineers to be included in the top grade of the FEANI registration over that period. The implication, no doubt, was that this would give us time to get our act together on a four-year academic degree. That moratorium was due to expire in June 1986 just over a year away. So this was a real challenge for the new BNCIEA particularly as there was an EEC directive for the mutual recognition of engineering qualifications looming ahead.

"But it concentrated our minds. We thought through many possible strategies and decided to base our case on raising the FEANI registration standard. Registration, we said, should not be based simply on the length of time of academic study but on the competence of the end product regardless of the qualifying route; in effect we decided to try and have something adopted very similar to the British professional engineer qualifying system. But we went further. We decided it would be helpful to suggest that as this should be an enhanced FEANI qualification, recognition of registration should be given by awarding an engineering designation. We suggested EurEng (later to become EurIng) and argued for it to be used as a prefix in front of a recognised engineer's name. [Editorial note: the proposed Eur Ing formula, later ratified by FEANI, see Chapter 3, was based upon a seven-year package incorporating a three-year, as a minimum, degree course. Thus, for example, a German or French engineer with a five-year degree would need only an additional two years of training/experience]

"We managed to get FEANI to set up a working party to consider our proposals and to report to their Registration Commission. We had George Adler, the BNCIEA deputy chairman, appointed to that working party and to the Registration Commission; George was later appointed a vice President of FEANI. In the event, after many working party meetings our proposals were agreed, the Registration Commission in turn agreed, and the FEANI Board confirmed acceptance at a meeting in Stockholm in May 1986.

"We had of course many other meetings, conferences and seminars on FEANI business, all at different locations throughout Europe and many extending over several days. I was very appreciative of the goodwill and friendship extended to us generally by the FEANI delegates at all of those meetings; there was always a genuine desire to reach agreement on even the most difficult of issues. I should perhaps not refer to anyone in particular, but nevertheless I should like to mention Finbar Callanan the Irish Engineers' representative from Dublin who was particularly helpful to us and a staunch ally.

"The European scene and FEANI dominated most of the business of the BNCIEA and there were many meetings of FEANI committees and sub-groups throughout the year. The FEANI headquarters at that time was in Paris where many of the meetings took place. Each year there was a large Annual General Meeting which rotated through the 20 member countries.

"The CEC and WFEO operated at a less intense level with their General Assemblies held every two years usually in consecutive weeks in the same part of the world to reduce delegates' travelling expenses. The BNCIEA sent one or more representatives to all these Assemblies and has contributed to discussions and actions on numerous international issues particularly on Engineering education and training matters."

Interfacing with Industry

From the formation of the EngC, meetings were held with major financial institutions and leading stockbrokers' analysts; these culminated in May 1983 with the EngC's Industry Directorate publishing the bright-blue covered booklet "Appraising the Technical and Commercial Aspects of a Manufacturing Company". Over 15,000 copies were distributed, aimed at investors, to provide a useful tool for those concerned with the well-being of industrial operations. As a consequence the EngC worked with the major clearing banks in adopting an appraisal document to assess small to medium sized companies. This 'blue booklet', bearing the EngC logo, was the forerunner of a number produced on various themes in the same format by the Industry Directorate.

As links with industry and with the academic world were forged and developed during 1983, many issues were debated within EngC committees. These resulted in another 'blue booklet' report that emanated from the Industry Committee "Technical Reviews for Manufacturing, Process and Construction Companies". Again over 15,000 copies of this were distributed, aimed at chief executives and senior management, encouraging them to include technical reviews in strategic plans and consider technical matters when a company prepares its overall business and marketing plans. A pilot scheme began with a number of companies participating. In the next chapter we describe how these initial efforts blossomed into the Industrial Affiliate Scheme. Graham Anthony the Director Industry, was a driving force behind all these publications and efforts, giving advice and support to the EngC's Industry Committee.

Interfacing with the Public

From the beginning the Council placed considerable stress on the importance of promoting engineering and the role of Engineers to industry and to the general public. The first Director - Public Affairs, Ron Kirby fully exploited his Fleet Street connections to the benefit of the EngC and writes:

"The Engineering Council was akin to an Aladdin's cave. It provided us so many opportunities for Public Relations (PR) work. The first Director General and my co-directors all supported the PR strategy. They saw that PR could raise the profile of the EngC and, more widely, of the profession. They all helped the PR team whenever asked to do so and frequently came up with ideas themselves. No request for a media comment or interview by publications, radio or TV was ever turned down. Several of my colleagues were introduced for the first time to national newspapers, national radio (especially the *Today* programme and *Any Questions* on BBC Radio 4) and TV (especially BBC *Question Time*). It was excellent teamwork in the start-up situation.

"The awareness advertising campaign which ran in *The Times*, the *Daily Telegraph* and the *Financial Times* became a classic. It came about after I had made a presentation to John Butcher, the DTI Minister on the need to run such a project; the DTI then funded the campaign. Its aim was to raise the public awareness of the EngC and to raise the profile of the engineering profession; A pre- and post- audit showed that it did in fact do this by several points. The four campaign advertisements ran as full pages and attracted so much attention that we produced them in poster form. We had a total of 65,000 requests over the ensuing year for copies of one of the posters entitled 'Why isn't there an Engineer's Corner in Westminster Abbey?' [see Frontispiece]. Wendy Cope, the poet of the year, wrote a poem

called “Engineers Corner”. This work was published in many newspapers and magazines and the BBC ran it several times in its *Poetry Please* programme on Radio 4.

“The *Young Engineers for Britain* competition, encouraging young people to design and make engineering products, became the flagship event to promote professional engineering to schools and colleges and, due to the fantastic media coverage, promoted the profession to the public. There were never any challenges to the tag we gave it – “the leading event of its type in Europe”. It had such a high profile that it could attract royalty and Prime Ministers to present the trophies and prizes.

“The *WISE* campaign was also extremely successful and played a key role in attracting young women to the profession. Again, the high profile of this campaign attracted the interest and support of the highest in the land, including Prime Ministers.

“With regard to Press Conferences and Press Releases, we perfected the staging of Press Conferences and the swift release of press statements focussed finely at our targets. Some of the key subjects included salary surveys, campaigns to attract more mathematics teachers, to keep technology in the National Curriculum and helping to bring about double award balanced science in the curriculum.

“Three of the people who researched a number of key educational topics for the EngC and who greatly helped to raise the EngC’s profile were Dr. John Williams the EngC General Education Executive, and two external contractors, Professor Alan Smithers and Dr. Pamela Robinson. They provided such sound, forward-looking information that the PR team was able to go out very strongly to the media with their results.

“An example of the pace of the PR operation came on one Budget Day when we issued electronically and nationwide an agreed press release within 30 minutes of the Chancellor’s statement – this time on tax relief on training – the culmination of a successful campaign which the EngC had led.”

It is also worth recording that in the 1985 Budget the Chancellor announced a £43 million programme to pay for more students to study engineering and technology. The notes to the Chancellor’s Statement included:

“This new programme follows the advice of the Engineering Council which has advocated an increase in resources for the education of engineers - see for example the Council’s Policy Statement on Resources for Engineering Education published in February 1984”.

The First Chairman Departs

At the end of April 1985 Sir Kenneth Corfield stepped down from the Chairmanship of the EngC having served for a year longer than originally planned. For four years he had invested an immense amount of time and effort to ensure a flying start for the EngC. He had carefully steered the Council in negotiations with the Government, the Institutions and the CEI. Also, working closely with the Director-General, he had presided over the establishment of a logical and tight administrative structure based upon the Standing Committees. He encouraged numerous projects which were to stand the EngC in good stead. Those included the establishment of the Regional Organisation, the WISE campaign, the launching of SARTOR and the development of international links on engineering qualifications. On the

Public Relations front several notable successes had been scored putting the EngC firmly on the map. In short the engineering profession owes Sir Kenneth a huge debt of gratitude for effectively continuing the work where the enterprise begun by Sir Monty Finniston had left off.

Fig.4 shows many of the original Council members and senior staff at a dinner held on 1 May 1985 to mark Sir Kenneth's retirement from the Chairmanship.

The Statutory vs Chartered Debate - continued

The question of whether the EngC could have had a better start and done a better job continued to rumble on, even after the granting of the Charter and approval of the Bye-Laws.

Kenneth Corfield wrote later:

"… I regret that Government has failed to give the EngC the "teeth" it needed, in which respect it failed the Finniston Report as Monty Finniston expressed to me personally in no uncertain terms."

Council Member Les Mercer later remarked:

"Come back Finniston - we need one qualifying body with real powers and Institutions to operate as learned societies."

Council Member Sir Gordon Higginson recollected:

"The biggest problem facing the formation and development of the Engineering Council was created by the attitude adopted by the Finniston Committee to the Engineering Institutions: the Report sidelined the Institutions, treating them almost with contempt. What followed was that Finniston took on the Institutions but lost. With that confrontation was also lost the opportunity that everyone wanted: the formation of a national body with authority and the support, indeed the sponsorship, of at least the major professional Institutions.

"It later took the tremendous effort of John Fairclough (see Chapter 5) and others to bring about a change to the structure, which was an improvement, but still fell short of what we wanted at the time of the Finniston Enquiry."

Council Member James Stephenson recalled:

"The Engineering Council was hindered, from its inception, by the refusal to accept the recommendation from the Finniston Committee that it should be a statutory body. For a long time, I felt the Institutions ignored it in the hope that it would go away, which gave the world, including potential registrants, the impression of a divided profession. Since the Council of Engineering Institutions, which preceded it as the registration body, was essentially confined to Chartered Engineering Institutions, a success of the Engineering Council was to promote the view of the engineering profession as an integrated body, including all registered Engineers. Another success was to provide a framework for qualification [SARTOR] which gave a comparable standard of competence across all the branches of the profession, something which was far from the case in 1981."

Back Row, left to right
Ron Kirby, Anthony Bond, Michael Harrison, Christopher Farrow,
Ralph Quartano, Alec Gambling, Eric Hammond, John Fairclough,
James Stevenson, Derek Embrey, John Waters, Peter Martin

Second row, left to right
John Carlill, John Lyons, George Heard, Graham Anthony, Malcolm Harker,
Joanna Kennedy, Geoffrey Drain, Jack Levy, Kenneth Miller, John Illston

Front Row, left to right
Hamish Orr-Ewing, Gordon Beveridge, Robert Malpas, Beryl Platt,
Kenneth Corfield, Detta O'Cathain, Ronald Hooker, Bernard Crossland, Alan Harris

Fig. 4 Farewell dinner for Sir Kenneth Corfield at the Caledonian Club 1 May 1985

Council Member James McHugh had hoped:

"That the EngC would be able to establish a position similar to that of the Council for the medical profession and thus provide a unified and single voice representing the views, position and status of engineers in the profession. There was a limited number of occasions when such a position was achieved but these were exceptions. I recall the debates on the Finniston Report and how different things would be if the Council was a statutory body!"

Nevertheless, from evidence available to the compilers of this Chronicle, the feeling among the EngC staff at the time was that the EngC, even as a Chartered Body, had achieved as much as a Statutory Body could have done in the same period.

Council Member John Lyons states:

"Of course, others had been pressing for an inquiry. But the TUC resolution [see Chapter 1] was the catalyst, the event that tipped the argument in Callaghan's mind when it mattered. At that time he had good cause to want to find something that he could do for the TUC, given all the difficulties between the unions and the Government there were in that period. (That was my motivation in submitting our motion to the TUC in 1976.) It is why Bernard Donoughue got involved. Donoughue was Wilson/Callaghan's political adviser. We were in contact on and off about the industrial relations scene as it affected the electricity supply industry, and also became friends as a consequence. Following a meeting I had with Sir Peter Carey, then the Permanent Secretary of the DTI, when he told me he saw no point in the inquiry the TUC and others were pressing for, I talked the issue over with Donoughue, ending by asking him if he would be prepared to brief Callaghan on it and get him on side. As he records in his book (*Prime Minister – The Conduct of Policy under Harold Wilson and James Callaghan – Bernard Donoughue, Jonathan Cape 1987)*, he agreed to do so.

"That intervention was decisive. I drafted terms of reference for consideration that I gave to Donoughue, and they were as close to those finally adopted (about which I was also formally consulted by Callaghan) as made no material difference. What was absolutely essential was that the Institutions should be kept at bay. I thought at the time, and have not changed my view, that creating a Chartered EC was a fatal mistake, though I did hope - I really did - that the work of the EC would demonstrate that I was wrong. Creating it as a Chartered body encouraged the Institutions, quite naturally, to think that the EC's *modus operandi* was essentially complementary to theirs and, therefore, that it was an organisation which one day they should and would be able to bring under their wing once the founders of the EC and their immediate successors had done their stuff.

"It is a very great pity that the Engineering Council was set up just too late. If it had been done in Callaghan's time I think it is reasonably likely it would have been created as a statutory body. Bernard (now Lord) Donoughue, doesn't think so, but a statutory body would have been much more in tune with the mind-set of the Callaghan Government and, of course, trade union influence would have still carried weight, whereas by the time Keith Joseph was in charge, we were completely out of the loop. However, whether, in the face of Institutional and departmental pressures, a Tory Government would have continued to finance a statutory body after - say - the first five years is another unknown".

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Chapter 3 - 1985 to 1988 : The Tombs Years

Building on Success

People

The Second Chairman

Sir Francis Tombs BSc, FEng, Hon FIChemE, FIEE, FIMechE, Chairman of Rolls Royce Ltd., and Chairman of Turner and Newall plc, was elected Chairman of the EngC on 1 May 1985. As with others before and after him, he rapidly became aware of the distrust felt in some Institutions of the EngC and with some success he spent much time trying to establish mutual trust and respect. Another problem he discovered was on the one hand the ambitions of the Institutions to dominate the Council and on the other the ambitions of some individually elected members to do so. He chaired a number of quite difficult Council meetings but was able successfully to maintain an independent and effective Council. This independence was highlighted at the first election of Council Members in May 1986 when the appointments hitherto made by the Secretary of State for Trade and Industry ended.

Funding for the EngC's activities dominated the opening months of Sir Francis Tombs's period of office. The Government's grant-in-aid was about to end on 30 June 1985, forcing the EngC to seek financial support from elsewhere, logically the engineering profession or the engineering discipline as a whole. To bring in additional cash, the annual fees for 1986 paid by individuals for inclusion on the EngC register were raised from £1.10 to £2.50 for Engineering Technicians, from £2.20 to £4.50 for Technician Engineers and from £3.20 to £7 for Chartered Engineers. Helpfully, all these increases were agreed by the Institutions which collected these registration fees from their members on behalf of the EngC.

Committee Chairmen and Other Changes

In 1986 and 1987 there was a general rearrangement of committee chairmen such that towards the end of 1986 Professor John Illston, Director of Hatfield Polytechnic, took over as Chairman of the SCET from Geoffrey Hall. On 5 May 1987 Robert Malpas relinquished his Chairmanship of the Industry Standing Committee but then joined the Finance and General Purposes (F&GP) Committee. He was replaced by Roy Roberts (Chairman of Simon Engineering and Deputy Chairman of the Dowty Group and of GKN). Dr Gordon Beveridge relinquished his Chairmanship of the Professional Institutions Committee but joined the Industry Committee and the F&GP Committee. He was replaced by Frank Chorley who was already a member of the BER. Ronald Hooker relinquished his Chairmanship of the F&GP Committee and was replaced by Jean Denton (Chairman of the Black Country Development Corporation, Chairman of Burson-Marsteeler and a Non-Executive Director of British Nuclear Fuels and of the Ordnance Survey). On 23 October 1987 Lewis Chelton took over as Secretary of the EngC on the retirement of John Carlill who had established a robust secretarial and administrative structure with appropriate procedures for the EngC.

Interfacing with Institutions

Nominated and Authorised Bodies

Towards the end of November 1985, as a framework for coordination and cooperation with the Professional Engineering Institutions began to emerge, attempts were made to bring consistency and improvement in standards. In accordance with the timing stipulated in its Charter the EngC published a second list of 43 Nominated and 28 Authorised Bodies, together with an explanatory booklet 'Raising the Standard'. Its opening statement "Qualified Engineers of tomorrow must be technically competent, market conscious, commercially adept and responsive to human needs", remains pertinent. This was published to link with the first edition of SARTOR.

A ***Nominated Body*** was defined as a body recognised by the EngC as fitted to certify the attainment of the EngC's standards of education, training and experience by individuals seeking admission to the EngC Register – which at this time contained the names of Engineering Technicians (EngTech), Technician Engineers (TEng) and professional engineers. A professional engineer who was a corporate member of a nominated Chartered Engineering Institution was able to use the title Chartered Engineer and the post-nominal letters CEng. Each Nominated Body was entitled to representation on one of the five Executive Group Committees (EGCs) of the EngC's Board for Engineers' Registration (BER) [see Fig.2].

An ***Authorised Body*** was defined as a Nominated Body which was authorised by the EngC to accredit academic courses which satisfied standards and criteria for education and training and arrangements to gain experience determined by the EngC in relation to individuals seeking registration on any section (CEng, TEng, or EngTech) of the Register.

An ***Institution Affiliated Body*** was defined as a body recognized as being able, in co-operation with a Nominated Chartered Institution, to propose individuals to be Chartered Engineers.

In March 1987 the EngC advertised for a Nominations Officer to assist with the assessment of Institutions applying to become Nominated Bodies. As a result Peter Swindlehurst, who after eight years in industry with English Electric had been for 27 years in the RAF, latterly with its Selection Board at Biggin Hill, was appointed in July to this post. In the following May he became the EngC's Education and Training Executive and later, Senior Executive Education and Training, a post he held until his retirement in June 1998.

The precise criteria for recognition as a Nominated Chartered Engineering Institution were developed during 1987 by the EngC's Nominations Committee meeting four times during the year. At the same time the principle of a periodic review of bodies already Nominated, Institution-affiliated or Authorised was explored and developed. The Nominations Committee, under the Chairmanship of Dr Gordon Beveridge (he dropped his title of Professor on his appointment as Vice Chancellor of The Queen's University of Belfast in 1986), developed Codes of Practice for Nominated and Authorised Bodies to ensure a commonality of approach between them. These Codes of Practice also sought to minimise the number of separate visits by the committee to academic and training institutions.

The Institution of Public Lighting Engineers changed its name in September 1985 to the Institution of Lighting Engineers. In 1986 three more Professional Institutions were added to the second (1985) List of Nominated Bodies, the Institute of Road Transport Engineers, the Plastics and Rubber Institute and the Minerals Engineering Society, and one Institution (the IRTE) was added to the list of Authorised Bodies. This meant that by 31 December 1986 the EngC had 46 Nominated and 29 Authorised Bodies.

The EngC continued to actively encourage Nominated Bodies to merge with others of similar interests. On 1 January 1987, the Bureau of Engineer Surveyors merged with the Institution of Plant Engineers. Later in the year the Society of Licensed Aircraft Engineers and Technologists merged with the Royal Aeronautical Society, and three Institutions combined to form the Institution of Water and Environmental Management – they were the Institution of Public Health Engineers, the Institution of Water Engineers and Scientists, and the Institute of Water Pollution Control. The Chartered Institution of Building Services Engineers became one of the 16 Nominated Chartered Engineering Institutions. Also during this year (1987) The Association of Supervisory and Executive Engineers, the Institute of Acoustics, the Institute of Physics and the Institute of British Foundrymen joined the Nominated or Institution-affiliated bodies of the EngC. Soon afterwards, the Institute of Executive Engineers and Officers merged with the Association of Supervisory and Executive Engineers to form the Institute of Incorporated Executive Engineers. The Institute of the Motor Industry withdrew as a Nominated Body and to safeguard its registered engineers they were advised how to remain in the special category of "individuals" on the EngC Register.

The 1987 EngC Annual Report declared that the Institutions "bring to the Engineering Council a wealth of experience in the assessment and development of individual registration of candidates and provide a major channel for communication with those expert in specialist fields of technology". By the end of 1987 thirty of the Nominated Bodies [listed in the 1987 Annual Report] were authorised to accredit academic programmes and twenty-one were authorised to approve training.

TEngs and EngTechs

Historically the Register had been skewed numerically towards Chartered Engineers; thus to encourage more students to contemplate TEng as an acceptable indication of engineering competence, a leaflet 'Your Route to Technician Engineer via BTEC Higher National Awards' was published in March 1987 jointly by the EngC and the Business and Technician Education Council (BTEC). This leaflet explained how students passing BTEC engineering courses could become Technician Engineers at Stage 1 (the educational stage) on the register – the first step in climbing the professional engineering ladder. Alternative routes to registration as Engineering Technician were also considered in 1987 for those large numbers working at this level in industry but not having a mainstream academic qualification.

By 1986 it had been recognised, as Sir Francis Tombs wrote in the EngC's 1986 Annual Report, that "confusion in the title [of Technician Engineer or Engineering Technician] by the juxtaposition of two words is a serious limitation to a wide acceptance of the two qualifications". Sadly, discussions throughout 1986 failed to find a more suitable title for Technician Engineer but during 1987 the term Incorporated Engineer was widely accepted by the Profession and Industry as more appropriate. There had been extensive debate and vigorous promotion for this change, led by Alan Gingell, the Secretary of the Institution of Electronics and Electrical Incorporated Engineers, the largest of the non-Chartered

Institutions at the time. Sir Francis Tombs commented this "will, I hope, lead to greater use of and recognition of the title" [Annual Report 1987]. A petition was made to the Queen, through the Privy Council, to approve the necessary changes to the EngC Royal Charter. Consequently, TEng formally became IEng in 1988 and all Technician Engineers were then redesignated as Incorporated Engineers. The confusion between Technician Engineer and Engineering Technician was thereby removed, although exactly what 'Incorporated' was intended to imply, and how this applied to an Engineer, remains a mystery for some to this day.

Engineering Profession Forum

To promote a better understanding between the Institutions and the EngC and to enable the Nominated Bodies to comment and offer discussion over the whole range of EngC activities, not just those concerning registration, an Engineering Profession Forum was established early in 1987; this comprised the President and Secretary of each Nominated Body and was chaired by the EngC Chairman. The Forum thus "strengthened the support and cooperation EngC received from the Professional Engineering Institutions". At the first formal meeting of the forum, held at British Petroleum's headquarters in London on 17 November 1987, the EngC was delighted that the Institutions were united in supporting the EngC co-ordination of schools' liaison activities in engineering.

Interfacing with Registrants

To maintain the register of engineers, in succession to Bob Bish who had died in service, Alan Wilmshurst was appointed as the EngC Registration Officer on 1 October 1987. He had been Engineering Administration Manager with Fisons Scientific Division at their World Headquarters in Uxbridge. With his small team Alan Wilmshurst continued to efficiently manage the EngC Register of Engineers and Technicians and many matters associated with the Registrants until his retirement at the end of September 2000.

The biennial 'Survey of Chartered and Technician Engineers 1985' was the first for which the EngC was solely responsible. The sampling technique was changed to produce a more representative response and questionnaires were sent to one in seven of Registrants on the EngC register on 1 April 1985. The survey showed that unemployment for Chartered and Technician Engineers was less than 1% at any time. Remuneration of those in work was in excess of £15,000 for over 59% of Chartered Engineers, compared with 32% in 1983. The highest paying employers were the Nationalised Industries, whilst Local Authorities paid the lowest median salaries to their engineers.

Regional Activities - the ECROs

At a regional seminar hosted in February 1985 by Lucas Industries plc in the West Midlands individuals representing the EngC met with representatives from engineering companies and the academic world. In the following May at a similar seminar hosted in Luton by Barclays Bank, engineers and others representing the EngC met local industrialists and their bankers to discuss practical problems faced in funding businesses. The EngC's previously published 1983 booklets 'Appraising the Technical and Commercial Aspects of a Manufacturing Company' and 'Technical reviews for Manufacturing, Process and Construction Companies' were used to catalyse the discussions. These booklets were subsequently reprinted following sustained demand.

During 1986 the EngC's regional involvement expanded. Each of the Engineering Council's nineteen Regions had established a committee with the responsibility (as stated in the EngC *Newsletter* of April 1986) to:

- publicise the profession locally, including contact with the local media
- arrange local meetings and conferences under the 'professional affairs' heading
- cover careers and education, including the 'Opening Windows on Engineering' scheme.

Graham Anthony, who had been Director – Industry since the formation of the EngC now became Director – Industry and Regions and a full-time senior executive, Alec Bennett, formerly Group Marketing Director of Langham Industries, joined the staff to coordinate and help lead the development of regional activities. In addition, Sir Robert Telford, Honorary President of the Marconi Company and Chairman of Prelude Technology Investments, of DRI Holdings, and of CTP Investments, took up the Chairmanship of the newly formed Engineering Council Regional Organisation Co-ordinating Committee (ECROC) that acted as a focus for the nineteen ECROs. A programme of activities and also guidelines for the ECROs were agreed during the year and the Surrey ECRO conducted a pilot survey of its 13,000 constituents, by circulating a newsletter and questionnaire; 2,100 replies were received including 1,200 engineers and technicians who volunteered to help with schools and industry activities. Other ECROs were able to build upon this experience, at the same time promoting a greater understanding at the local level of the EngC's policies and activities. In 1987, for instance, three further ECROs issued newsletters and questionnaires to their (approximately 2,000 each) registrants, and received a 15-20% response supporting local activities.

By the end of 1986 several ECROs had part-time staff, and offices were opened during 1987 in Cardiff, Liverpool and Newcastle. The SW Region ECRO had a senior engineer seconded full-time by British Telecom. The Yorkshire ECRO ran a pilot scheme with eleven local education authorities in Yorkshire and Humberside to focus on schools. Two ECROs in Scotland jointly organised, in conjunction with Strathclyde Regional Council, an evening careers conference that was attended by 200 educationalists, parents, careers offices and EngC staff. The ECRO in Cardiff was offered premises in 1987 following the Welsh Industry Forum held there. Also during 1987, honorary ECRO Public Relations Officers were invited to two workshops to help them make better use of local media in promoting the Engineering Profession. Informal talks were held with Young Engineers' Liaison Committee (YELC) officers to encourage more YELC members to seek election to the Engineering Assembly [see below], and to become more involved in ECROs, particularly with WISE liaison. The periodic Engineering Council *Newsletter* sent to all Registrants included as a standard item brief reports from every one of the nineteen Regions. By any measure the launch of the ECROs, with coordination by ECROC, was a resounding success as engineers of all Institutions worked together locally on a variety of schools' liaison activities and other events.

The Engineering Assembly

It will be recalled that early in 1983 Dr Kenneth Miller had conceived the notion of an Engineering Assembly whose members were directly elected by Registrants through the regional system. Its birth was realised on 3 September 1985 when the Prime Minister, the Rt Hon Mrs Margaret Thatcher, opened the first meeting of the Assembly that was attended by 114 representatives and held over two days at the University of Birmingham. The 114

attendees consisted of four Chartered and two Technician Engineers elected by each of the nineteen regions. A four-page Special Report on the Assembly had been published by *The Times* on the previous morning. In an advertisement contained within that report the EngC pointed out that "The Engineering Council was set up to promote the cause of engineering in Britain", its slogan being "Fighting to help Britain make it". In her remarks, the Prime Minister concluded: "It is for Government to create the right background conditions, but it is you Engineers who can grasp the opportunities and make our future prosper and I'm here today for one reason: to show the importance this Government attaches to your work, your profession and your role in our future. Our country's success needs you!" The full text of Mrs Thatcher's speech to the Assembly was published by the EngC in October 1985 as "The Prime Minister Talks to Engineers – Engineering Assembly 1985".

The second annual Engineering Assembly was held in July 1986 at University College, Swansea; on this occasion the guest of honour was the Secretary of State for Wales, The Rt Hon Nicholas Edwards, QC, MP. In Sir Francis Tombs's own words in the EngC's Annual report for 1986, the Assembly was "now developing into a useful consultative body". It was reported that some 'Young Engineer' observers from the regions made significant contributions to the Assembly discussions and it was decided that the involvement of engineers of this generation at Assembly meetings should be repeated.

At the third Engineering Assembly, held in July 1987 at Heriot-Watt University, Edinburgh, the guest of honour was Lord Sanderson of Bowden, Minister of State at the Scottish Office. It became evident that the annual Assembly was a most effective forum through which the profession as a whole could voice its opinion on EngC policies. It was felt that the higher standard of debate at the 1987 Assembly was a direct result of the ECRO's local activities leading to the greater understanding of the overall role of the EngC. Two young engineers from each region were again invited as observers. Matters debated this year included:

- Technician Engineers and Engineering Technicians.
- The coordination of presenting the engineering profession to the young through a more effective Engineering Careers Co-ordinating Organisation (ECCO). [At this time ECCO members were largely acting independently with no unifying theme.]
- Effective communication by the EngC to the public of a better image for professional engineers and engineering, and effective communication with Registrants.
- The development of joint activities in the regions for the Industrial Affiliates and the ECROs.
- Stimulation of the use of the three titles, CEng, TEng and TechEng, with particular reference to linking of job titles with responsibilities.
- Representation of Registrants on the EngC's Council.

Interfacing with Schools

WISE

The role of women and girls in engineering was pursued with some vigour during this period through the WISE campaign begun in 1983, as we mentioned in Chapter 2. Girls, women and employers were all targetted. A WISE conference, sponsored by IBM(UK) Ltd, was held in Cambridge in December 1985 when the EngC's report 'Career Breaks for Women Chartered and Technician Engineers' was published at £5. Two associated surveys were also published during this month at £5 each: 'Attitudes of Employers', a survey undertaken by the

Engineering Industry Training Board (EITB), and 'Attitudes of Women', a survey undertaken by MIL Research Ltd. The report and associated surveys continued to be in demand over succeeding years and in 1986 and 1987 several conferences on this topic were held. The second WISE bus set off from Parliament Square as an Industry Year project in mid 1986 on a nationwide technology tour, after being visited by several dozen Members from both Houses. Financial aid was obtained from the Manpower Services Commission (MSC) towards the production of a career break video 'The Other Half'; this was launched in the Spring of 1987 at a press conference held at the Careers Research and Advisory Council's (CRAC) Career Break Conference. The video supplemented the EngC's 1985 careers break report and highlighted the benefits to companies of retaining existing women engineers and technicians by providing career break schemes and attracting high calibre women into engineering in the future.

In 1986, to monitor the progress of WISE year, a survey was taken of first-year entrants to science and engineering degree courses at universities and polytechnics. This showed a steady increase of women entering both engineering and science courses from 1982 to 1985. It was decided to repeat this survey annually. To support the WISE campaign a wide range of publicity materials was produced during 1987: for example, in May 'Science and Engineering Degree Courses – Women Entrants 1982/3 to 1986/7', and in August an information sheet 'Women Into Science and Engineering'. In September 'A Woman's Touch' poster, published by the EngC, aimed at 12-15 year olds, was distributed to every school in the UK. Later during 1987 a third WISE bus entered into operation setting off around the country with promotional and educational materials prepared for a female readership. The co-operation of the Equal Opportunities Commission and the EITB assured a wide dissemination of the message. A survey indicated that over the previous four years there had been an increase from 7.8% to 10.5% in women entering engineering degree courses. Nevertheless, skills' shortages continued to cause concern amongst employers and so the EngC, according to the1987 Annual Report, determined that "the promotion of WISE will remain a vital crusade in support of Britain's improving industrial competitiveness"

Neighbourhood Engineers

In December 1986 the Rt Hon Kenneth Baker MP, Secretary of State for Education and Science, launched the EngC's 'Opening Windows on Engineering' scheme on a national scale, thereby expanding the EngC's activities in the nineteen regions. 'Opening Windows' was a free service, aimed to demonstrate to 12-15 boys and girls (and their teachers) that engineering was not only a respectable and worthwhile career but also a major wealth creator for Britain. During 1986 these efforts had linked with another significant notion, 'Neighbourhood Engineers' that was being piloted in Cardiff and Plymouth. This involved local registered engineers being attached to nearby schools to help teachers in a practical way. As a result of the 'Opening Windows' scheme being confirmed as a priority for the ECROs, a seminar was held in September 1987 for sixty representatives from the ECROs around the UK. The seminar dealt with recruiting and training people under the age of 34 as "window openers".

In recognition of his pioneering activities in originally devising the 'Opening Windows on Engineering' scheme Kevin Walton of Stockport was presented with a certificate by Sir Francis Tombs in 1987. In succeeding years 'Neighbourhood Engineers' developed extensively, as we shall describe in Chapter 4.

Young Engineer for Britain

Administration of the Young Engineer for Britain (YEB) competition, undertaken by the EngC from 1983, continued annually during this period. As incoming Chairman, Sir Francis Tombs demonstrated his support for the competition in September 1985 by presenting the awards at the National Finals at Wembley, following Regional Finals held in July and August. In the following year the competition was given even greater publicity in the national media when Diana, Princess of Wales presented the prizes and awards at the YEB international finals, again staged at Wembley. A Special Report on the 1986 Competition was published in September 1986 by *The Times* newspaper. The cover of the report bore a photograph of The Princess presenting the YEB trophy to 16 year-old Matthew Barker of Edlington Comprehensive School, Doncaster, for his "muscle stretching machine" to improve the suppleness of athletes and dancers.

During 1987, to acknowledge that a number of financial institutions had joined the EngC as Industrial Affiliates, it was felt appropriate for the YEB competition to be held at the National Westminster (Bank) Hall in the City of London. On this occasion the awards were presented by Heather Couper, astronomer, broadcaster and writer. The event, sponsored by the National Westminster Bank and Dial Industry Publications, was covered on fourteen television programmes and publicised in 70 reports in newspapers and journals. In 1986, 1987 and 1988 financial support was also generously provided by the Comino Foundation for a 'Who Wants to be a Millionaire' project within the YEB remit. Also during 1987 the EngC, in conjunction with the Comino Foundation, explored ways of helping some of the YEB competition entrants to establish their own businesses.

Other Schools Activities

In December 1985, to support the technology curriculum in schools, the EngC published 'Problem Solving: Science and Technology in Primary Schools'. Then, during 1986 the EngC took over the Secretariat of the Engineering Careers Co-ordinating Organisation (ECCO) working closely with ECCO members who included careers professionals, engineering Institutions, trades unions and Government Departments. The ECCO engineering careers database used The Times Network Systems to circulate information.

In April 1987 the booklet 'Want to Teach Maths, Science or Technology?' was published with an accompanying press release. The EngC was campaigning for more mathematics, science and technology teachers in schools, convinced that the Government was not giving this issue adequate attention, particularly in view of the core curriculum requiring more able and competent teachers for these topics.

In June 1987 a statement of support, 'Double Award Balanced Science', was issued jointly by the EngC with the Secondary Science Curriculum Review. This pressed for the development of the GCSE Double Award Balanced Science (which involved physics, chemistry and biology each being studied to the same depth up to the age of 16, enabling successful students to receive two GCSE awards). The media gave good coverage of this and over 50,000 copies were requested by educational organisations. Twenty-four bodies had subscribed to the statement by the end of 1987.

Interfacing with Further and Higher Education

SARTOR

Codes of Practice relating to SARTOR, by now the generally accepted acronym for the Policy Statement 'Standards and Routes to Registration' originally published in December 1984 [see Chapter 2], were produced by the Board for Engineers' Registration in 1986. These set out procedures for nominating individuals to the Register and accrediting courses, programmes and arrangements for education, training and experience. SARTOR specified three stages that had to be attained before individuals could register as CEng, TEng or EngTech. These were:

> Stage 1 - An appropriate academic qualification: the exemplifying standards were specified as an accredited degree for CEng, HNC for TEng, or ONC for EngTech.
> Stage 2 - Appropriate training: usually of not less than two years' duration.
> Stage 3 - Relevant experience, including some of a responsible nature: usually not less than two years' duration.
> [Stage 4 - A Professional Review was a later addition.]

Thus for aspiring Chartered Engineers, for example, the total minimum time would be seven years comprising, for Stage 1, a three-year accredited degree plus, for Stages 2 and 3, four years of training and experience. SARTOR set out the general standards and requirements for all three stages. It was then the responsibility of the Nominated and Authorised Bodies – i.e. the Professional Engineering Institutions - to provide and apply details for their own branches of engineering. A recurring theme in the 1980 Finniston Report found an echo in the SARTOR statement that design should form a thread running through all three Stages and that the "Engineering Application" components EA1 and EA2 advocated by Finniston should be integrated into academic courses.

The basic philosophy behind SARTOR was that it provided a **minimum** (though high) standard which all registrants had to meet. However it was open to any Nominated Body to impose its own additional membership requirements. For example, the Institution of Structural Engineers required all CEng candidates to sit a practical design examination.

SARTOR was constructed on the principle of "ladders and bridges" enabling those starting at a low level, say on an Ordinary National Certificate course aiming at Engineering Technician, to transfer, if successful, to higher courses of education and training leading to TEng or CEng, sometimes being excused the first year of these more advanced courses. This principle of "ladders and bridges" had been urged in a letter of 21 January 1983 to the EngC from the Department of Education and Science (DES), using Lord Hailsham's words of some twenty years previously when the CEI was being established [see Chapter 1]. This practice was in distinction to that of other professions where, for example, it was not generally possible for someone studying nursing to become a doctor without starting again. The "ladders and bridges" diagram associated with SARTOR is reproduced in Fig.5. At the same time the DES letter cast doubt, in the light of the development of some four-year MEng degree courses, on the need for all accredited engineering degree courses to be longer than three years. It did, however, leave the door open for further discussion on an extension to four years. This general extension was not to take place until 14 years later [see the SARTOR-3 story in Chapter 6].

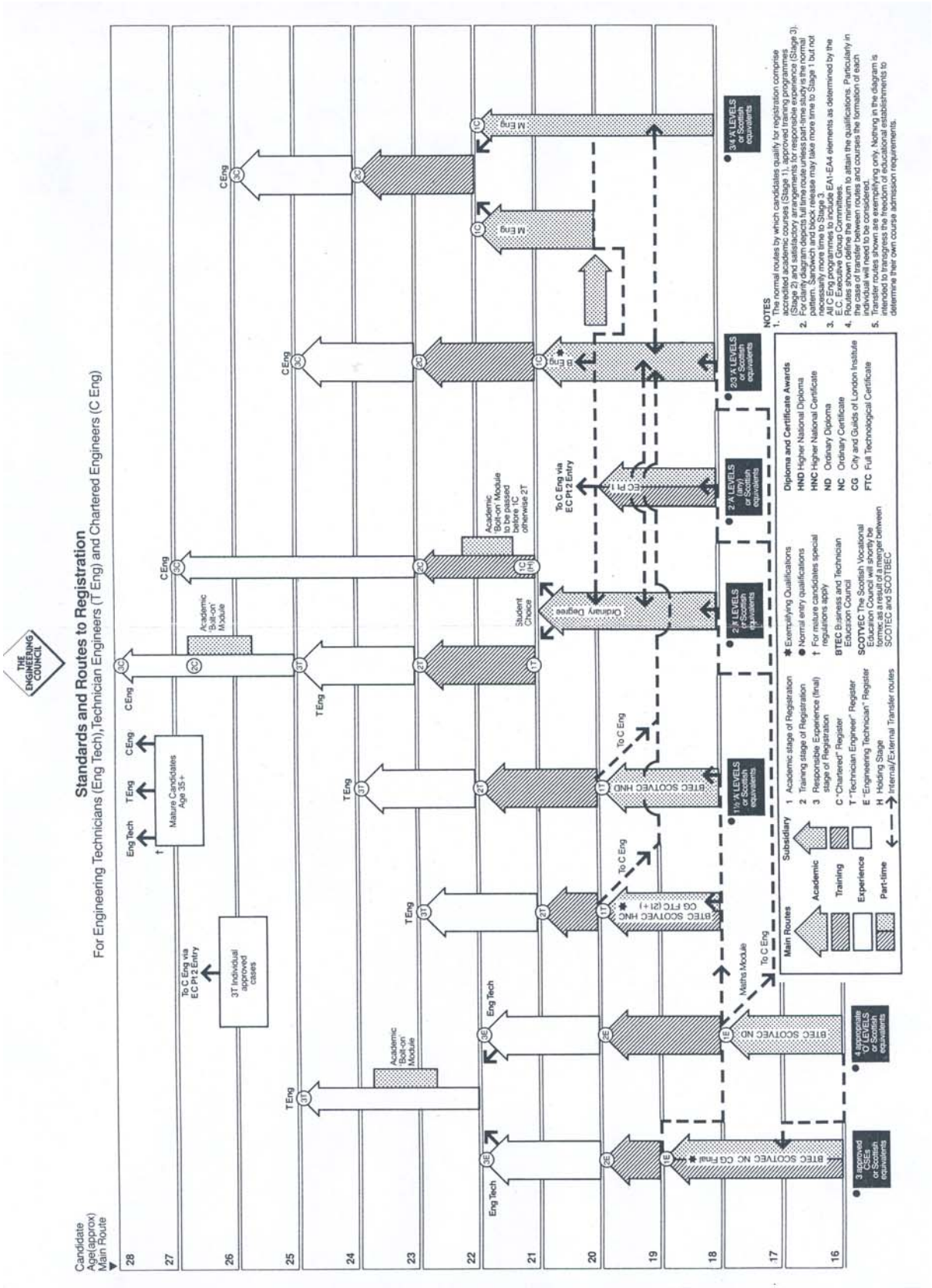

Fig. 5 Standards and Routes to Registration 1985

SARTOR was by now accepted as setting national standards for engineering education and training. A list of accredited UK degrees was prepared during 1986 and the "Mature Candidate Route Scheme" was developed enabling those without appropriate formal academic qualifications, but with the requisite knowledge gained by other means, to become a CEng or TEng by writing a thesis and being intensively interviewed. About 100 candidates per year achieved registration by this route, compared with some 6,000 by conventional SARTOR routes. An updated list (Issue 2) of Accredited UK degrees was published in July 1987.

On 1 January 1988 an important fourth stage to SARTOR was introduced. This was a structured interview (termed a professional review) conducted by the Institutions for every person applying to become a Chartered or Technician Engineer, thus fulfilling all the requirements of SARTOR and its related Codes of Practice for Nominated and Authorised Bodies. The introduction of the professional review followed previous practice of the Institution of Civil Engineers. Employers of engineers and technicians were increasingly recognising and demanding the EngC standards.

National Initiatives in Further and Higher Education

During 1984 and 1985 there was a growing concern in Government circles about deficiencies in the UK system of vocational qualifications – not specifically in engineering but across all areas of commercial and industrial activity. In 1985, the Manpower Services Commission, the Department of Education and the Department of Employment established a committee for the 'Review of Vocational Qualifications' (RVQ). The EngC was invited to participate and Professor Levy, Director – Engineering Profession, became the EngC representative. The main purpose of the RVQ, envisaged by the Government Departments, was to establish a framework of national training levels from the lowest (level 1) to professional levels at the top. The EngC objected to the professional levels being included at this point, maintaining that UK professional standards were well understood and accepted internationally and that the UK's real need was for a dramatic improvement at training levels 1 and 2. The resulting National Council for Vocational Qualifications (NCVQ) should, Professor Levy wrote in an article in *The Times*, gain a good track record at those levels, and possibly at level 3, (approximately HNC) before getting involved at degree and professional levels. The day before the RVQ report was published, Dr Miller and Sir Francis Tombs met with David Young, the Secretary of State for Employment, to express reservations and the following day the EngC published a strongly worded Press Release.

The consequent lack of focus within the NCVQ led to an extremely patchy introduction of NVQs. Literally millions of pounds were expended which would have been better applied to giving more support to established examining bodies such as BTEC, CGLI and the RSA. Even over a decade and a half later, NVQs had made little impact in comparison with the resources used. Had the RVQ concentrated on the lower levels as a policy from the beginning, as the EngC recommended, much more progress could have been made in this important area. In 1987 the EngC continued to be concerned about NVQs at higher levels but, in the interests of national progress, was represented on the NCVQ Professional Bodies' Advisory Group and on three of the industry-based project groups that considered proposals for vocational qualifications. Over 40 Nominated Bodies joined in the EngC's response to NCVQ on the relationship with Professional Bodies. An NCVQ consultation paper on credit accumulation was commented on by the EngC.

Soon after the EngC Chairman Sir Frank Tombs had taken office, he was told by the Prime Minister, Margaret Thatcher, that she expected industry to put more resources into Engineering Training and that she would have a meeting with industrialists in six months time for them to report on their progress. At that meeting in February 1986 the Chairman lead a team of 30 leading Industrialists and academics who were able to demonstrate that Industry had put up an extra £26 million. At the same meeting Sir Francis Tombs, on behalf of all present, drew attention to the need for additional resources for higher education and technology. The Prime Minister issued an invitation to indicate how the supply of school-leavers with science, technology and mathematics qualifications could be increased, which raised the importance of the shortage of mathematics and physics teachers. The outcome was an agreement for key figures from relevant Government departments to meet the EngC. The Secretary of State for Education and Science invited the EngC to establish a working party to review industrial demand and places for students in courses other than Information Technology – see also later in this chapter under 'Interfacing with Industry'.

This resulted in Robert Jackson, Parliamentary Under-Secretary at the Department of Education and Science, on behalf of the Secretary of State (Kenneth Baker), announcing in a speech to the CBI in 1987 the funding by Government of additional places in universities and polytechnics for highly qualified manufacturing systems engineers. The Under-Secretary also commmended the EngC's WISE campaign. The EngC, however, remained concerned about the need to improve the supply of students into engineering, and hence developed a series of proposals covering 5-19 year olds that included:

- Supporting the Government's proposals for 'The National Curriculum 5-16'.
- Promoting the double award balanced science GCSE.
- Supporting the new Advanced Supplementary (AS) examinations.
- Pressing for design to be an integral part of technology in the core curriculum.

Throughout this period the EngC continued to press for more funds and resources to be made available for engineering education to meet the highest international levels. Representations were made to Government on its White Paper 'Higher Education – Meeting the Challenge'. A Government inter-departmental working group published an interim report 'International Comparisons of Higher Education Output in Engineering' in the *Employment Gazette* for December 1987. This report claimed that the UK was producing the same number of engineers at degree or sub-degree levels as France, Germany, the United States of America or Japan. However, the EngC, supported by the CBI and the Engineering Employers' Federation, stated this was just *not* true. The Government's report was based upon UNESCO studies which sadly were fundamentally inaccurate as UNESCO had allowed each country to make its own interpretation of the raw data. This made a nonsense of using the figures for international comparison – a point made in the EngC press conference on this topic and by Kenneth Miller on the BBC Radio 4 'Today' programme, although no Minister was available to comment. This matter was not resolved until May 1988 when the EngC published its own study 'A Comparison of he Statistics of Engineering Education – Japan and the United Kingdom', clearly supporting its position.

The EngC, being committed to widening access to higher education in general, and engineering degree courses in particular, held a joint conference in 1987 with the Standing Conference on University Entrance (SCUE); this examined how higher education institutions could achieve greater flexibility, such as welcoming people with entry qualifications other then traditional 'A' levels. It was agreed that 'AS' levels and other mixes of 'A' levels and

other qualifications, such as BTEC awards, were acceptable. Industry wanted broadly-based graduates, a need that was supported by the EngC by publishing 'AS Levels are Important' in September 1987 and by involving its Industrial Affiliates (see below) in its consultations and discussions. The EngC also supported the Higher Technology and Engineering Conversion Courses (HITECC) offered by polytechnics. Close links with the Engineering Professors' Conference (later Council) were also maintained to develop such courses.

The University Grants Committee (UGC) also sought proposals for an improved course structure. At the same time the range of existing courses was examined by the EngC and the Industrial Affiliates, culminating in the EngC report of December 'Restructuring of Engineering Higher Education', offering three possible models for change. This attracted wide publicity in the national, educational and institutional press. Over 200 formal responses were received during 1988 with widely varying views from the Professional Institutions, industry, academia, trades unions, training boards and collective groups. As 1988 progressed, the divergence of opinion narrowed when other, external, initiatives emerged and those most involved in developing engineering education began to work together. An independent rapporteur was engaged by the EngC to analyse the responses during 1988 to form the basis of a more closely-defined proposal that was published in November 1989.

The EngC was awarded a contract worth over £160,000 by the Manpower Services Commission in 1987 for a pilot Engineering Applications Demonstrator Project to be completed in early 1989. This pilot was undertaken by nine Higher Education Institutions (HEIs) under the guidance of a steering committee comprising representatives from the EngC Initial Education and Training Committee and the Nominated Bodies. New approaches were considered towards incorporating the Engineering Applications 1 (EA1) and Engineering Applications 2 (EA2) concepts of Finniston into degree courses, to bring together engineering theory and practice. Industry co-operated in most schemes. The resulting examples and ideas, due for publication in 1989 as we shall see in Chapter 4, were to be used by many other HEIs.

In February 1988 as a joint statement, the EngC and the Society of Education Officers published '16-19 Education and Training', spelling out the need to widen access to higher education and for greater recognition for non-traditional routes. In another collaborative venture the EngC, jointly with the Further Education Unit in March 1988, published 'The Key Technologies – Some Implications for Education and Training'. This accompanied presentations made at the South East Consultative Panel for Physical Sciences in Further Education and at a National Conference, hosted by Gloucestershire College of Technology. This publication was also used in the Training Agency's Experimental Programme and in the Technical and Vocational Educational Initiative (TVEI) and by others managing the introduction of technology in schools.

The EngC Examination

On 15 September 1985 the Examinations Department moved from the former CEI base at Orchard House, Westminster to Savoy Hill House, not far from Aldwych, so joining the Registration Department in offices leased from the Institution of Electrical Engineers. This new location was conveniently closer to the EngC main offices in Maltravers Street.

In 1987 the numbers of candidates accepted to sit the EngC examinations fell for the first time for some years (by almost 1,200), chiefly because of the higher standards introduced by SARTOR. There was now a requirement for formal course work and a project being included

at Part 2 level. An Examination Review Working Party was set up by the Board for Engineers' Registration to reconsider the guidance and rules for candidates and to review the structure and syllabi of the Examination.

Continuing Education and Training

'A Call to Action – Continuing Education and Training for Engineers and Technicians', prepared by Bernard Dawkins, the EngC's CET Executive in the Engineering Profession Directorate, was published in June 1986. This well-received report looked at clear links between a company's performance and its investment in the CET of its employees. Two Annexes were also published: an 'Industrial Consultants' Survey' and a 'Summary of Responses to the Discussion Document'. The report was followed up in 1987 with a well-attended conference in Liverpool dealing with Britain's urgent need to improve the CET for engineers and technicians.

The EngC further developed this theme in a consultative document 'Continuing Education and Training: A national system for engineering', calling for Career Action Plans in which engineers should consider and state their intentions for CET for a year or more ahead. This proved extremely popular in early 1988 with requests pouring into the EngC at the rate of 500 a week from industrial executives who had read about it in the press. Consequently the EngC had to reprint the discussion document within six weeks of its launch. A working party was established and a Workshop held at the University of York followed by pilot schemes to test the ideas on a national scale later in 1988, as we shall describe in Chapter 4.

The document 'Management and Business Skills for Engineers: a Statement – Continuing Education and Training' was published in March 1988, contending that engineers could become very successful managers. The statement reviewed the background and suggested how individual engineers interested in management and business skills should learn about business.

Interfacing Internationally

FEANI and European Engineer (EurIng)

International agreement on the Eur Ing standard, mentioned in Chapter 2, was reached in 1986, with important contributions coming from the British National Committee for International Engineering Affairs (BNCIEA), involving a fundamental revision of the FEANI Register. This now laid down minimum standards for registration and a system for monitoring and up-dating standards. Following an agreement between BNCIEA and FEANI which finally gave international recognition to Chartered Engineers (see Chapter 2) the term "European Engineer" and associated designatory letters "Eur Ing" were launched in Paris in October 1987 during a ceremony at the Luxembourg Palace. The five chairmen of the Executive Group Committees of the Board for Engineers' Registration, and five other Britons, were among the first 60 professional engineers to be awarded the title European Engineer.

For Technician Engineers a seminar, organised by the EngC and chaired by Sir Monty Finniston, was held in 1987 at the Royal Society of Arts on their role, education and training in countries other than Britain, particularly France, West Germany, USA and Japan. The speakers were four Churchill Travelling Fellows.

Interfacing with Industry

The Industrial Affiliate Scheme

The remit given to Graham Anthony on his appointment to the EngC as Director-Industry was to "encourage the competitiveness of British industry" – a direct link back to the Charter and, indeed, to the Finniston Report. The Director believed this could be advanced by British engineering companies employing registered engineers, but realised that companies needed to enjoy close links with the EngC to appreciate the value and significance of a registered engineer. He recognised an opportunity here to not only help British industry but also to secure much-needed funding for the EngC. In the summer of 1984 he conceived the idea of industrial companies linking with the EngC as "Industrial Affiliates" by paying an annual subscription related to the number of their employees or engineers. In launching the Industrial Affiliate scheme on 1 July 1985, supported by the personal efforts of Sir Francis Tombs and Dr Kenneth Miller, Graham Anthony took a considerable step forward. Although many Council members supported the scheme enthusiastically, surprisingly some were either neutral or indifferent to this enterprising innovation. Dr Miller writes:

"At the Highgate House Conference [see Chapter 2] in September 1984 the main topic had been how we should approach companies to become Industrial Affiliates and support the work of the Engineering Council. We knew that Industry's performance could be greatly enhanced if firms employed high quality engineers and technicians, and we believed that we could and should invite the leading companies in the UK to support us financially (the largest companies would subscribe £10,000 per year). Bob Malpas, Chairman of the Industry Standing Committee, David Plastow, another Council member, Graham Anthony and I called on all the leading companies to persuade them to support us.

"We started our recruiting shortly after the Highgate House Conference, and arranged for the first subscriptions to be received after the second half of 1985 when the Government three-year grant-in-aid would cease. We had on board companies for which some of the Council members were directors starting with British Petroleum and General Electric.

"Annual Industrial Forums were held for the industrialists to give us their views on the education in schools, universities, and polytechnics, the shortage of Engineering Technicians, and the part their engineering staffs could play in working with the ECROs on "Opening Windows on Engineering" and "Neighbourhood Engineers".

"The ECROs and the Engineering Assembly were linked by their elections direct to the individual Engineers and Technicians in the Profession, and much of their work became a useful link with the Industrial Affiliates. This I considered to be an important development."

And so companies that became Industrial Affiliates gained direct access to the EngC to join in common enterprises. In return a company not only contributed financially to the work of the EngC, but also agreed to encourage its engineer employees to become registered as CEng, TEng or EngTech through an Institution of their choice. The result of all this and many other innovations brought in a total independent income of £1,631,490 during 1985, considerably counteracting the loss of grant-in-aid from Government. Some £171,000 of this income was from the Industrial Affiliates, many of whom also reimbursed the registration fees of their engineer employees.

By November 1985, 115 industrial organizations, as Industrial Affiliates, were subscribing to the EngC's work. They first met together as an "Industrial Forum" in that month, with 94 senior executives participating. During 1986, although four Industrial Affiliates withdrew after mergers and takeovers, a further 40 were recruited, resulting in a total of 166 of the leading UK companies with a combined annual turnover of £300 billion, and bringing into the EngC almost £465,000 a year. The Industrial Forum became an annual event, the second Forum being organised and hosted by the EngC in November 1986, attended by 100 directors and senior managers from over 70 of its Industrial Affiliates. The EngC *Newsletter* of March 1987 announced a target of 1,600 Companies by 1991.

Besides the financial support to the EngC that Industrial Affiliates brought, the essential aim was to improve industrial performance by heightening the respect for the professional engineer and technician. This began to bear fruit during 1986 as the concept of registration for engineers and technicians gained ground. Meetings were held with Industrial Affiliates in Edinburgh, Glasgow, Manchester and Birmingham and two were held in London. The topic of the first London meeting, Continuing Education and Training (CET), resulted in 'A Call to Action' [already mentioned above under the CET heading] being published in June 1986, following which a working party was set up to consider a 'career manager' document. In Chapter 4 we shall look at the output from this working party, a consultative document that was eventually published in 1988. The second London meeting in 1986 resulted in two EngC booklets being published: 'The Shortage of Mathematics and Physics Teachers' in May and 'On Being a School Governor' in July, taking advantage of the Education Act (1986), to encourage engineers and technicians to become Governors.

An Engineering Working Group was set up by the EngC to identify what should be done to mark Industry Year 1986. This Group made a significant contribution to the ultimate success of Industry Year, particularly in strengthening industry/education links. The Working Group continued to play its part during 1987 under the banner of "Industry Matters", following up the sterling work undertaken during the previous Industry Year.

A conference to promote an industrial dimension in teacher training courses was organised in 1987 at Homerton College jointly with the University of Cambridge and in association with Industry Matters and Industrial and Commercial Perspectives.

The Chairman wrote to the Industrial Affiliates in 1987 regarding Registration and the use of the CEng and TEng titles; he received 100 supportive replies with only two reservations. During this year regional meetings of Industrial Affiliates were hosted by British Nuclear Fuels Limited at Risley and by the United Kingdom Atomic Energy Authority at Annan. Presentations were made to Engineering Employer's Boards in the Midlands and South Lancashire, to the local branch of the Institute of Directors and to the Chief Executives' Club in Surrey, and to 75 invited industrialists and academics at Hatfield Polytechnic. Many Industrial Affiliates were concerned that there was a need for graduates in subjects other than Information Technology. Accordingly, in 1987 the EngC persuaded the Government to provide funds for courses in Manufacturing Systems Engineering as the second stage of the Engineering and Technology programme 'The Switch'. In addition, the National Advisory Board for Public Sector Higher Education announced a special initiative that produced 30 extra places on courses starting in 1988.

Pursuing its championing of engineering and technology the EngC made major submissions in 1987 in response to the report of the Select Committee on Science and Technology 'Civil

Research and Development' and to 'A Strategy for the Science Base' published by the Advisory Board for the Research Council. The EngC believed that the national research and development programme should be relevant to the improvement of industrial competitiveness. The Annual Report 1987 stated: "Industrial investment in research and development needs to be encouraged as an essential on-going activity that needs to be stimulated, managed and controlled to yield rewards in the longer term".

In November 1987, at the third Industrial Forum, over 100 Directors and senior managers from 75 Industrial Affiliates discussed the topic of Engineering Technicians. The expansion in numbers continued and by the end of 1987 there were 174 Industrial Affiliates, some recruited through the Engineering Council Regional Organisations (ECROs) that had been established in 1984 as Engineering Regional Organisations (EROs), as we mentioned in Chapter 2. Even so, the desire for further companies to become associated with the EngC inspired the publication in April 1988 of two related pamphlets: 'Registration Matters! – Employers, Engineers and Technicians' and 'Why You Should Be an Industrial Affiliate'. The Industrial Affiliates, through their links with the EngC, were now becoming involved in a number of diverse projects being coordinated by the EngC for the benefit of British engineering and the engineering profession, completely in line with the way that Martin Wiener's book had inspired Dr Miller, the EngC's Director General.

The Industrial Affiliate scheme was not always looked upon favourably by the Institutions because of a perceived overlap with their own interests. Subsequently some began their own similar schemes - and one even convinced itself that it had invented the idea. Nevertheless, by mid-1988 the EngC had enrolled as Industrial Affilates all the major industrial companies, oil and chemical companies, the Nationalised industries and from the City of London the four clearing banks. By the end of that year the number of Industrial Affiliates had risen substantially and their subscriptions of around £500,000 represented some 16 to 17% of the Council's total income.

At an Industry Matters exhibition in May 1987 'The Technical Review' EngC brochure [see Chapter 2] was distributed, describing the success of Technical Reviews carried out during 1986 by about ten companies - part of a demonstration project run by EngC in conjunction with the Department of Trade and Industry (DTI). A Technical Review was described, in the context of overall business and marketing plans, as a continuing appraisal of technical objectives and capabilities. It focused attention on the importance of engineering resources and their effective use throughout the processes of design, production and marketing. The EngC sought ways by which Technical Reviews could be used by the DTI when assessing grant support for industry.

Also in 1987 the presentations for the Prince of Wales Award for Industrial Innovation and Production were made by the Prince at Highgrove House; the ceremony was shown on BBC's Tomorrow's World. Practical support was provided by some venture capital firms to the finalists and other highly-rated entrants to help their businesses into production (always a long-term aim of the Award).

'Trade Up Your Technology' was published in November 1987 as the fourth in the series of blue booklets produced by the EngC's Industry Directorate. The aim was to stimulate managers and investors to consider how collaboration with others could improve their companies' technical capabilities, enhance their products and processes, and thus improve their competitiveness.

Taken collectively, the activities of the Industrial Affiliates, the Technical Reviews, the Prince of Wales Award for Industrial Innovation, the "European Engineer" title and the "Young Engineer for Britain" represented solid advancement of the EngC's aims in relation to industry and the employment of engineers. Unfortunately this momentum was not always to be sustained in later years.

Interfacing with the Public

An analysis of the media coverage for 1986 shows that some 525 reports emanating from, or about, the EngC were published in national and regional trade, technical and institutional papers and journals. Of these, 90 appeared in national papers and many were of feature length. In addition there were 31 television and radio broadcasts of which 23 were national. Examples of publications issued in 1986 include, in January, 'Take Action for Engineering - Industry Year 1986', and 'The Board for Engineers' Registration' [the latter was republished in April and October 1986] and 'A Closer Look at Engineering' in June. In that month also a booklet 'Managing Design for Competitive Advantage' was published in conjunction with the Design Council [it was reprinted in March 1989] to encourage managers to review their design processes as a means of improving profitability and competitiveness. A Guidance Statement on Engineering Council Registrants and Trade Union membership was published in July 1986.

In 1987 the EngC's curriculum-related publications were accepted onto the national Electronic Resources Information Service (NERIS) database; they were then available in schools and other educational establishments via Prestel and The Times Network Systems (TTNS). In July *The Times* published 'A Special Report on Tomorrow's Engineers'.

The biennial 'Survey of Chartered and Technician Engineers', sampling 27,000 of the 300,000 registrants, was published in October 1987. This showed that over the past 12 months more Registrants had received further training than during the previous survey of October 1985, especially on courses on business studies and management training. The gross average earnings for Chartered and Incorporated Engineers had kept comfortably ahead of prices (as had the published survey selling at £50 in 1987 compared with £25 in 1985!).

'The Consumer Protection Act 1987 – A Stimulus for Improving Safety', which was a statement on the perceived effects of the Consumer Protection Act, 1987, was published in March 1988 in the EngC's blue booklet series on awareness of technology. Some 15,000 copies were distributed through the British Standards Institution, The Society of British Aerospace Companies, The Society of Motor Manufacturers and Traders, the Engineering Industries Association and the Engineering Employers' Federation.

Fig. 6 illustrates EngC publications produced in 1987 alone. These demonstrate the successful efforts of the Industry Directorate and the Engineering Profession Directorate together with the presentational skills of Public Affairs. With all the activities relating to education, industry and the public, the statement in the Annual Report that 1987 was "the year in which there was a marked improvement in the [Engineering] Council's national status" was well founded.

THE ENGINEERING COUNCIL

Publications issued by The Engineering Council in 1987

Fig. 6 A Selection of EngC Publications issued during 1987

Changes at the Top

In May 1988 Sir Francis Tombs stepped down from the Chairmanship of the EngC having presided over a quantum leap in its liaison work with schools, the regions and industry. Sir Francis had also encouraged significant developments in setting standards of engineering education and training. We should note here that Sir Francis's tremendous contribution to the EngC, the profession and to British engineering achievement were formally honoured in the New Year's List for 1990 when he became The Rt Hon The Lord Tombs of Brailes.

Shortly after Sir Francis Tombs's retirement as Chairman of the EngC in 1988 its first Director General, Dr Kenneth Miller, also retired. Dr Miller had served the EngC consummately well from its early days. He had assembled a strong management team and had encouraged numerous initiatives with schools, universities, industry and the media. His energy was tireless in promoting the way and purpose of the Engineering Council and he gained the respect of successive Chairmen, Council Members and staff. If at times he had ruffled the feathers of Institution Secretaries that was usually because he felt that they were not prepared to work wholeheartedly within the federal structure implicit in the creation and remit of the EngC. Nevertheless Dr Miller was generally held in extremely high regard. Some felt that his CBE awarded in the June 1998 Birthday Honours was less than he deserved.
A number of founder members of Council also retired at the end of April 1988 - Professor Bernard Crossland, Professor Alec Gambling, Robert Malpas, Sir Richard O'Brien, Roy Roberts, and John Waters. All had given sterling services for no personal gain and all continued to support the EngC and to act as ambassadors in its cause in a variety of capacities.

Chapter 4 – 1988 to 1990 : The Barlow Years

A High-Water Mark

People

The Third Chairman and the Second Director-General.

A double change at the top of the EngC took place in 1988. The EngC's third Chairman, Sir William Barlow BScTech HonDSc, HonDTech, FEng, FIMechE, FIEE, was elected on 17 May 1988, a post he held until 31 December 1990. He was already Chairman of British Insulated Calendar Cables plc and Non-Executive Director of both Thorn EMI plc and of Racal Telecom plc. From the outset Sir William's wish was to use the EngC as the platform for promoting the engineering profession to Government and the public, and also for commenting at a national level on issues having an engineering involvement. This was right in line with Monty Finniston's original concept of the EngC as an "Engine for Change". Sir William also wanted to work harmoniously with the Engineering Institutions. Accordingly, on assuming office he immediately met privately with some 15 Presidents on an individual basis and repeated this exercise with Institution Secretaries. Whilst each President appeared prepared to co-operate with the new management, limited headway was made as each was elected on a different date and in most cases for only one year.

Two and a half months after Sir William's appointment the second change at the top of the EngC took place. On 1 August Denis E Filer TD, BSc, BA, FEng, FIMechE, FIChemE, CBIM, Director of Engineering at ICI, with which he had worked since 1955, took over from Dr Kenneth Miller as Director General. Denis Filer had been on the EngC Council since May 1986, and so was well versed in its current aspirations.

In his endeavours Sir William worked closely with the new Director General. Denis Filer's personal style was helpful as he was neither aggressive nor confrontational and as a Vice President of the Institution of Mechanical Engineers he knew that body particularly well. The new Chairman and Director General openly held regular combined meetings with the Presidents and Secretaries of the four big Institutions (in addition to the Engineering Professional Forum), but as Sir William later commented: "There never seemed to be the same four Presidents at consecutive meetings because of their election dates. Typically a new President would arrive with little real knowledge of the interface but with lots of anecdotally-based prejudice which usually had been displaced by the third meeting - but at the following meeting a successor would appear. The Secretaries all had axes to grind but shared a common determination to defend their positions and oppose any increased financial support for the EngC. The Institution of Chemical Engineers and the Institution of Electrical Engineers were the most intransigent at this time."

Not that the faults were necessarily all one way. A later Council member James McHugh observed:

"Relationships depended, to a great extent, on the personalities involved. The representatives of the EngC and the bodies with which they dealt, were continuously changing and sometimes the *rapport* was better than at others. I gained the impression that, at times, the representatives of the EngC could have been more diplomatic when they were dealing with representatives of Institutions."

Despite all this the Chairman and the Director General patiently went over the same issues time after time; by the end of Sir William's three-year term it seemed that relations between the EngC and the Institutions had improved and worked reasonably well. As Sir William stated in the Annual report for 1989, "UK Engineering is an important element in our national life and we want to help the profession and industry as much as we can".

The first occasion Sir William selected to comment publicly on an engineering issue was on the publication of an excellent report from the Advisory Council for Applied Research and Development (ACARD) on the significance of electro-optics. As this referred to many issues of national importance he organised a press conference and commented on the report. But instead of appreciation for a prompt engineering response, he received criticism from several Institutions and even from some EngC Council members. The opponents on Council said plainly that the EngC had no mandate or duty to make pronouncements on behalf of the profession. The Institutions stated that it was their job to comment but, in fact, none of them could do so without consulting their members and none had a rapid reaction mechanism for this. At a special brainstorming meeting of Council held at the RAC Club this issue was thrashed out and the result was that the majority felt that the EngC should *not* make public pronouncements on specific issues. Sir William believed this was a serious lost opportunity and if the EngC, covering 48 Institutions, could not speak for the profession, he was convinced that one of the main reasons for its existence was also lost. Nevertheless, from time to time, as Chairman of the EngC and despite lacking support from the Council, he did speak out on national issues, finding both Government and the media willing to listen and note his views.

At the instigation of Sir William Barlow in 1989, His Royal Highness The Duke of Kent, KG, GCMG, GCVO, ADC, was invited to become the EngC's first President, thereby publicly raising the profile of the engineering profession. As a member of the Royal Family with a demonstrable interest in engineering and manufacture, The Duke of Kent was a logical choice; at that time he was Vice-Chairman of the British Overseas Trade Board and a non-executive Director of both BICC and Vickers plc, besides holding other posts in the fields of science and technology. He was, for example, Patron of the British Computer Society, a past President of the British Association for the Advancement of Science and a past President of the former Institution of Electronic and Radio Engineers. Although at first hesitant about accepting the position, His Royal Highness subsequently demonstrated his support for the work of the EngC by attending many functions, meeting committee members and visiting the staff at the Maltravers Street offices.

1989 marked a clear change in emphasis, if not in direction, for many of the activities of the EngC, its committees, panels and working groups. The influence of a new Chairman and a new Director General was obviously making an impact. The Government introduced novel ideas into the nation's education system and considerations of "Europe" began to influence the thinking of policy makers. Whilst some EngC activities continued seamlessly during this period, others were phased out and new initiatives were introduced.

Interfacing with the Institutions

Nominated and Authorised Bodies

One of the long-standing aims of the EngC had been to reduce, by amalgamation, the numberof Institutions, some of which had very small membership numbers. Generally,

though not always, amalgamation occurred only when financial pressures became overwhelming or when a Chief Executive or Secretary retired. Two such mergers were a feature of 1988, one between two chartered bodies, the other of two non-chartered bodies. The first involved the Institution of Electrical Engineers and the Institution of Electronic and Radio Engineers that amalgamated under the former's title. In the second the Institution of Mechanical and General Technician Engineers merged with the Institution of Technician Engineers in Mechanical Engineering to form the Institution of Mechanical Incorporated Engineers. Also during the year the Institute of Measurement and Control became a Nominated Chartered Engineering Body of the EngC in its own right, rather than having an affiliation arrangement with the Institution of Gas Engineers. The Institute of Ceramics joined the EngC as a Nominated Body.

'A Guide to the Engineering Institutions', devoting a page to describing each Nominated Body, was prepared by Senior Executive Brian Senior and published by the EngC in May 1988 to increase an awareness of the Institutions, and to promote an understanding of them and between them. This publication was followed by 'About Registration' in June 1988 to give potential Registrants and Institution members some details about the EngC's Register. Then, to help the Institutions and also to guide potential Registrants the EngC published in July, issue 3 of the 'List of Accredited UK Degrees'; this contained brief notes on some 700 courses accredited by EngC Nominated Bodies in universities, polytechnics and colleges. Issue 4 of the list was published in August 1989.

During 1989 the Association of Supervisory and Executive Engineers changed its name to the Institution of Incorporated Executive Engineers, and in November the Hong Kong Institution of Engineers, the only non-UK body to so do, joined the EngC's Institution-Affiliated Bodies. (Institution-Affiliated Bodies were recognised as being able, in co-operation with a Nominated Chartered Engineering Institution, to propose individuals to be Chartered Engineers). The Society of Civil Engineering Technicians merged with the Institution of Civil Engineers, enabling the latter to nominate Incorporated Engineers and Engineering Technicians, as well as Chartered Engineers, to the EngC Register. By the end of 1989, after seven years of mostly fruitful co-operation on qualification, there were 47 Nominated Bodies, 27 of which were authorised to accredit academic courses, 21 to approve industrial training programmes and two to accredit arrangements for experience.

At this time a significant event having a potential major impact on the EngC and the engineering Institutions was the Third Engineering Profession Forum (for the Presidents and Secretaries of all Nominated Bodies), held in December 1989; the theme was 'Amalgamation and Vertical Integration of Nominated Bodies'. The officers and officials met Council members to investigate the possibility of setting up some form of federation between the Institutions.

Then during 1990 the Society of Electronic and Radio Technicians merged with the Institution of Electrical and Electronics Incorporated Engineers to form the Institution of Electronics and Electrical Incorporated Engineers. In September of the same year the Association of Cost Engineers became an Institution-Affiliated body (within EGC-4). The British Computer Society became a Nominated Body (following a 4-year, sometimes heated, debate on whether 'computer software engineers' really were engineers – and here we can see some shades of the original rejection of mechanical engineers by the Institution of Civil Engineers - see Chapter 1). This was a highly significant event marking the recognition of software engineers as potential CEng and IEng Registrants.

Towards the end of 1990 the EngC comprised 47 bodies (the same total as in 1988 - but there was a broadening of the EngC's influence as there had been mergers and new bodies were admitted). The Nominations Committee, which vetted all applying Institutions, was responsible to the Standing Committee on Professional Institutions. An example of its work was to begin reviewing the nominated statuses of 31 bodies in 1990; 19 were approved for renewal while for 12 the existing status was extended to 31 May 1991 as the reviews had not been completed. Most authorisations were for accreditation of academic courses (27). Twenty-three were for industrial training programmes and three were for arrangements for experience.

The status of "Professional Associate" was introduced in 1990 for bodies that wished to be linked to the EngC. Their activities in contributing to engineering were welcomed by the EngC but they did not seek to be qualifying bodies in the same sense as those enjoying Nominated or Institution-Affiliated status. The Institution of Royal Engineers, established in 1875, and the Safety and Reliability Society, established in 1980, become the first two Professional Associates of the EngC.

The Fourth Engineering Profession Forum was held on 4 November 1990 during which four topical priority projects were discussed: Engineering Occupational Standards, Review of Engineering Education, Continuing Professional Development [see below] and Neighbourhood Engineers.

Interfacing with Registrants

In the EngC Annual Report for 1988, Sir William Barlow suggested that all Registrants display their Certificates of Registration at their workplaces to demonstrate that they held significant qualifications. Also he asked them all "to reflect what they could do, in addition to their jobs, to promote the impact on our profession in national life". The Annual Report itself took on a new style with photographs (and these featured the Chairman and the Director General) appearing for the first time. The Chairman's Foreword was retained but a Director General's Report and a Report of Activities replaced the former Reports of the Council published in previous years. The aims and objectives of the EngC [which are reproduced in Annex E] were clearly presented on a full page of the Annual Report, a practice that was repeated in the Reports for 1989 and 1990.

During this period, from 1988 to 1990, the EngC *Newsletter* continued to be published every spring and autumn for the benefit of Registrants. Each issue was packed with news on the many diverse activities of individuals, committees and the EngC as a whole. In April 1990 issue 11 was redesigned, using a larger typeface and colour photographs for the first time. When events took /place that merited particular notice, an "Extra" issue of the *Newsletter* was distributed.

For the benefit of new Registrants, a re-designed plastic registration card was issued in January 1989 and EngC ties, stick pins, self-inking stamps and certificates were made available from September 1989 to all Registrants enabling them to display their links with the EngC. Over 11,000 certificates and 11,000 cards were issued during this year.

The "Eminence Route" to CEng was approved by the BER in 1989, intended for a very small number of engineers who had clearly attained eminence in their field but who had not followed any of the normal routes to registration as Chartered Engineers. Also in 1989, a

working party was set up to produce Rules of Conduct to supplement the existing brief Code of Conduct. This cost the EngC over £45,000 in legal and professional fees for verifying that the Rules were absolutely correct – doubling the EngC's normal annual costs for such fees.

In October 1989 the biennial survey of 'Chartered Engineers, Incorporated Engineers and Engineering Technicians' was made available at £100 (four times the 1985 selling price). The survey, the fourth published by the EngC, and based on a 15% sample of Registrants, again examined Registrants' salaries, employment positions, and foreign language skills, and their involvement in school-industry links. It was clear that Registrants had again received salary increases comfortably in excess of the Retail Price Index. The numbers satisfied with their initial training increased, as did the numbers who declared they would recommend an engineering career to young people. It also emerged that 40% of Chartered Engineers and 22% of Incorporated Engineers had a basic knowledge of a foreign language. The numbers of unemployed engineers had fallen yet again, indicating that career prospects were good.

Engineering Council Regional Organisations

A further seven of the nineteen ECROs that we mentioned in Chapter 3 found offices in 1988 from which to operate, bringing the total to ten with their own identifiable accommodation. Their addresses were printed for the first time in the 1988 Annual Report for the benefit of readers who did not have access to the EngC *Newsletter*. The EngC provided the regional offices with data-processing facilities to enable Registrants to be linked into activities close to their homes or work places. All ECROs were provided with a training pack containing two videos to help the 'Opening Windows on Engineering' campaign. One video 'The Floor is Yours' gave guidance on public speaking, the other contained three presentations showing 'Window Openers' in action.

The Fourth Engineering Assembly, held at The Queen's University of Belfast in 1988, was opened by Rt Hon Mr Tom King, Secretary of State for Northern Ireland. Addressing the delegates, mainly ECRO representatives, as usual, he stated that "by climbing through all the media" the EngC had made its mark. It was disappointing, however, that only 81 of the 114 elected members attended. Ron Kirby arranged that the *Daily Telegraph*, in cooperating to raise an awareness of the status of Registered Engineers, published a list of newly qualified Chartered and Incorporated Engineers to coincide with the opening day of the Assembly. That newspaper event set a precedent that was repeated in subsequent years and also by other newspapers.

Following a strong request from the 1988 Assembly, that Registrants be enabled to participate more fully in developing and promoting EngC policies, a new Standing Committee for the Regions and Assembly (SCRA) was established in 1989 under the chairmanship of Dr Gordon Beveridge. The SCRA comprised representatives from the regions, the Assembly and the Council, although the arrangement necessitated a change in the EngC Bye-laws. The first meeting of the SCRA was held at Huddersfield Polytechnic on 19 July, the final day of the 1989 Assembly and was followed by two further meetings later in the year. It was anticipated that members of the SCRA would make contact with individual elected members and with ECRO Chairmen.

Denis Filer advocated [in the EngC 1989 Annual Report] that over the next 10 years an Engineering Centre be established in every major centre or region, focussed on the ECROs, with help from the EngC but promoted locally. These Centres, he stated, should offer local

careers guidance, learned society functions for all engineering disciplines, engineering libraries, and become focal points for industry-education links and even for training and examinations, with each having its own Continuing Education and Training Adviser. The North East had already set up the first one in Newcastle upon Tyne with support from Northern Engineering Industries and the North East Coast Institution of Engineers and Shipbuilders. By the end of 1989 another had been put in hand with support from BT at Long Aston near Bristol.

The activities of the nineteen ECROs continued to develop markedly during 1989. Fifteen of the nineteen now had Regional Offices, each with secretarial support and data-handling facilities. By the end of 1990 eighteen of them [that is, all but one] had offices. The scheme was being successfully put in place by the EngC from London but, as activities continued to develop, more volunteer Registrants were urgently needed to help with ECRO activity. It was anticipated that during 1990 the ECROs would be able to link into the EngC's Regional Affiliates and enable the ECROs to enhance links between Registrants and local activities [Industrial Affiliates had been re-branded as Industry Affiliates from 1989, as we shall explain below.] The success of the ECROs was, as it sadly transpired, not to be continued as they fell into other hands as will be seen later in this Chronicle.

The SCRA made a significant contribution to the EngC's work in 1990. Still under the chairmanship of Dr Gordon Beveridge, the Committee reviewed the Engineering Assembly and the EngC's regional structure that had been established in 1984. The SCRA decided that Regional Administrative Centres, similar to the Northern Engineering Centre at Newcastle upon Tyne, should service the regions. The Midlands was considered as the next possibility. However, the growing number of ECRO activities, the launch of the Neighbourhood Engineers scheme, and the spread of CET limited the number of SCRA centres that the EngC could support and finance. As only eleven could be afforded, the SCRA proposed that the ECRO boundaries should be rearranged to encompass a complete number of local education authorities, and so facilitate SCRA activities. This proposal was put forward for discussion at the 1991 Engineering Assembly.

Interfacing with Schools

WISE

To promote the WISE campaign [now four years old and continuing to be led by EngC senior executive Marie-Noëlle Barton] the earlier, 1984, targets of girls, women and employers were broadened in 1988 to include parents, teachers and careers' advisers. A poster 'Engineering – A Woman's Touch' was produced with schoolgirls specifically in mind and circulated to all British secondary schools in September 1988. The poster was also circulated to 7,000 youth clubs via the 'Youth Clubs' magazine for display to the 750,000 youngsters attending such clubs each week, and supplied to a third of the doctors' surgeries and health centres in the United Kingdom for their waiting rooms. A video promoting career breaks for women who were existing Chartered or Incorporated Engineers was awarded a Certificate of Merit by the British Association for the Advancement of Science at its annual film and TV awards ceremony. Following this publicity the video, 'The Other Half', financed by the Manpower Services Commission, was made available from the EngC for purchase at £5.75 or on free loan for a month.

This campaign continued its success during 1989. To assist the move in encouraging girls and women to take up a career in engineering, the number of events in the booklet directory 'WISE – Awards, Courses, Visits' was expanded in February 1989 from 27 to 58 entries and reprinted for free issue thanks to sponsorship from BICC plc. In April 1989 two companion 'Engineering Equals' booklets were published with financial support from the Training Agency. For both booklets the Foreword was signed jointly by the Rt Hon Norman Fowler MP, Secretary of State for Employment, and Sir William Barlow, the EngC Chairman. The booklets, 'Engineering Equals – Higher Education Institutions' and its companion, 'Engineering Equals – Schools and Colleges', offered guidance to teachers on methods of encouraging young women to consider engineering as a career option and avoid the pitfalls of gender stereotyping. A third version of this booklet, for staff in primary schools, was produced in 1990 in partnership with the Society of Education Officers and the Association of Directors of Education in Scotland and with support from 21 other educational bodies. The Introduction to this version was written by Rt Hon Kenneth Clarke, Secretary of State for Education and Science. Copies were distributed to 27,500 primary schools throughout the United Kingdom.

In 1990 a new 40ft articulated trailer, sponsored by British Rail's Signalling and Telecommunications Division, was added to the fleet of WISE mobile classroom vehicles. During the year the EngC issued the 4th edition of 'Awards, Courses and Visits', the directory listing events to encourage girls and women into an engineering career; this edition, sponsored again by the BICC Group, promoted 149 special events. By the close of the year 75,000 girls had benefited from the WISE campaign. Of students now entering engineering degree courses, 12% were women compared with 7% when WISE began in 1984 although once more the EngC received little, if any, recognition for this major and far-reaching achievement.

Neighbourhood Engineers

Through its Neighbourhood Engineers scheme the EngC planned to encourage and harness local enthusiasm to make a genuine impact on entrenched attitudes in British schools towards engineering, and to change the nation's culture away from negative images. It was hoped that full-time project managers with secretarial support could be appointed in every EngC region. The idea was to link over 30,000 Registrants with local secondary schools in their neighbourhood so that four or five Neighbourhood Engineers could be allocated to every school in the country, giving advice and support on projects, designs and materials. The engineers would work with the Heads of Science and Mathematics thus meeting the particular needs of each school in a sensitive and practical way. The scheme, begun as a trial in Devon and Cornwall, South Wales and the South West then underwent a full Demonstrator Project during 1988 in 225 schools in Merseyside and Cheshire. In support of the scheme a booklet 'Neighbourhood Engineers – Practical Support for Schools' was published in December 1988.

In the Merseyside and Cheshire Demonstrator Project over 10% of local EngC Registrants participated. Eric Forth, Parliamentary Under Secretary of State for Industry and Consumer Affairs visited the EngC offices early in 1989 to hear at first hand about this project. The DTI provided £600,000 to help set up the scheme, on condition that the EngC could raise similar resources, particularly from industry. British Nuclear Fuels plc provided one of its engineers, Brian Thomas CEng, on secondment to manage the overall project. Other industries provided full-time secondees to act as project managers, released engineers and technicians to visit

schools, and contributed materials and equipment. The EngC used some of its own [i.e. Registrants'] money for this venture.

By 1989, the Scheme was operating with the help of 1,500 Neighbourhood Engineers in over 450 schools in seven regions – Devon & Cornwall, South Wales, South West, Merseyside & Cheshire, Kent & Sussex, Scotland East, and Northern. Five senior Chartered Engineers, as full-time Project Managers, were seconded from Industry Affiliates – BNF plc, OveArup & Partners, Rolls Royce plc and NEI plc. The plan to use 30,000 Registrants was reassessed, but the result was that at least 24,000 were deemed necessary to be able to attach 3 or 4 practising engineers or technicians to every secondary school in the country; it was felt that this Scheme would then be effective in all regions over the following three years. Her Majesty's Inspectorate of Schools informally examined the development of Neighbourhood Engineers in Devon & Cornwall and in Merseyside & Cheshire, and produced a most encouraging report that included phrases such as "it is having a much more beneficial affect than other forms of promoting engineering".

Several activities took place in 1989 in which an Industry Affiliate assisted in the Neighbourhood Engineers' scheme in the secondary school sector. British Petroleum (BP), for instance, collaborated with the EngC to support the 'Exciting Science and Engineering' initiative, developed at the University of York by BP engineers with support from the Yorkshire ECRO. Schools up and down the country were encouraged to contact and utilise the expertise of local engineers and consultants.

At the end of 1990 the Neighbourhood Engineers scheme was operating in nine of the nineteen regions. Industry Affiliates had seconded staff to act as Neighbourhood Engineer Project Managers. The scheme had spread to 800 out of 2,700 schools in the regions, involving 3,400 active engineers and technicians. As there were 6,000 schools to cover overall, another 20,000 engineers and technicians had to be mobilised. It was hoped to achieve this over the following 2 to 3 years and the DTI gave £612,000 in support over three years from 1990. The helpful document 'Neighbourhood Engineers – Practical Support for Schools' was reprinted in December 1990 following its original publication in December 1988.

A further initiative conveniently linking with Neighbourhood Engineers was the publishing in November 1988 of 'Opportunities as a College Governor' designed to encourage Chartered and Incorporated Engineers to take up such posts. This responded to a requirement of the 1986 Education Act (no 2) for the business community to have increased representation on school and college governing bodies from September 1988. The ECROs were asked to encourage engineers to contact their local schools and colleges. This proved effective, as from 1989 onwards many Neighbourhood Engineers became School Governors and some became Chairmen of school-governing bodies.

Young Engineer for Britain

In maintaining contact with the youngsters themselves during this period, the EngC continued to promote the Young Engineer for Britain competition. The First Prize at the 1988 National Final was presented by Sir Peter Walters, Chairman of BP plc to Paul Dagley-Morris of Cheltenham College for his Rapidcall radio transmitter alarm system that could be worn on a belt. The final was hosted by National Westminster Bank plc at its Old Banking Hall in the City of London. Industrial Affiliates, Dial Industry Publications and the DTI provided

support through funding, the donation of prizes and the organising of regional finals. An entrant on a previous occasion who had been supported by the 'Who Wants to be a Millionaire' campaign, had made such good progress with his own engineering business that he was also awarded a prize from the Comino Foundation. The competition was well supported by national and local media.

The Young Engineer for Britain national final for 1989 was again hosted by National Westminster Bank at its Old Banking Hall. Dial Industry Publications sponsored this competition for the last time but Lloyd's Register of Shipping and British Gas plc offered sponsorship for future years. The coveted title of Young Engineer for Britain was won in 1989 by Nigel Herbert for a pocket-sized viscometer. The event was again well covered by the national media. Prizes were presented by the EngC Chairman. The DES instituted a prize of £600 for the school entering the competition for the first time with the most imaginative project.

The 1990 Young Engineer for Britain competition continued to be hosted by National Westminster Bank and sponsored, on this occasion, by this bank and Lloyd's Register. Awards were presented by HRH the Duke of Kent. The winner was 13 year old Ben Scammell from Trent College for 'Cookmate', an electronic device indicating when a barbecue attains the correct cooking temperature.

Other Schools Activities

Under Sir William Barlow's chairmanship liaison continued with schools and school teachers at several levels. In May 1988, for instance, a conference was held with the Assistant Masters' and Mistresses' Association, building on the work previously undertaken with King's College London and Trent Polytechnic to consider the introduction of technology into the curriculum. Staff at King's and Trent had been involved in preparing the 'Technology Education Project' report. At the end of the year, also looking at curriculum issues, the EngC and the Royal Society promoted a national conference to explore progress on Advanced and Advanced Supplementary (A and AS) levels. A Government Committee of Inquiry on this topic, chaired by Council Member Dr Gordon Higginson, Vice-Chancellor of Southampton University, had proposed broadening the base of post-16 education in schools to five subjects but the Government, unlike educationalists, employers and the EngC, had not accepted the main thrust of the Committee's report. The Government was concerned over the considerable funding implications that might have resulted from a consequential general lengthening of university degree courses from three to four years so that students could achieve the traditional depth in specialist subjects. At the conference held in December 1988 Denis Filer and the Secretary of State for Education and Science made key-note speeches.

During 1988 'A Co-ordinated Programme to Capture Young People's Imagination', dealing with many aspects of the EngC's work with schools and colleges in the 5-19 age group, was published as a policy review document. This addressed curriculum development, careers' advice and community involvement and proved useful in the work with Industrial Affiliates and in guiding Nominated Bodies in their activities in schools. This topic had previously been debated in April 1988 at the first Engineering Profession Forum, during Lord Tombs's term of office, but at the end of 1988 the long-term funding for such work remained a problem. 'The Promotion of Modern Engineering' scheme formed part of the 5-19 programme to create an awareness of modern engineering among all young people. This scheme attempted to extend the partnership with schools and colleges in collaboration with Government, local

education authorities, teacher organisations and others active in this field. Pupils, parents and teachers were all told of employment opportunities in engineering within four broad groupings: Multi-skilled Craftspeople, Engineering Technicians, Incorporated Engineers and Chartered Engineers. Five engineering categories were used, broadly based upon the EngC's five Executive Group Committees:

civil, structural, construction and building services;
manufacturing systems, mechanical and production;
electrical, electronic and information technology;
process industries such as food, chemicals and minerals;
transport.

Also aimed at young people, a careers' pamphlet 'Engineering for People' was developed during 1988 explaining how teenagers could become involved in the teamwork of modern engineering, and at the same time drawing attention to the fact that professional engineers were well paid.

In February 1988 the EngC, jointly with the Society of Education Officers, produced a statement '16-19 Education and Training'. This aimed to give this age group a broader and more balanced experience in education and training. By welcoming routes other than A-Level it also indicated a wider gateway into higher education.

On the Government's National Curriculum Design and Technology Working Group, chaired by Lady Margaret Parkes, the EngC was represented by the Director General, Denis Filer. The Group's report was issued during 1989 and accepted by the Secretary of State. As a consequence the EngC's Director – Industry and Regions, Graham Anthony, was invited by the School Examination and Assessment Council to join the Committee on Technology.

Following up on the National Curriculum, a conference was organised by the EngC in July 1989 and held in Lincoln for initial teacher trainers, local education authority advisers and inspectors to consider Technology in the National Curriculum for primary schools. Contributors included Nick Stuart, Deputy Secretary for the DES and Jim Rose, Chief Inspector, HMI. Implications for training at national and local levels, implications for classroom practice, mechanisms for implementing change, and the provision of resources from industrial links were debated by reviewing the report of the Design & Technology Curriculum Working Group.

'Engineering the Future – A view from the Schools' was published in January 1990 by the EngC with the Secondary Heads' Association to reform courses for 16-18 year olds as a result of the National Curriculum being introduced into all schools in the UK. Recommendations were made as to how the Government could address the on-going shortage of science and mathematics teachers. Then in May, to stimulate industrial employers to help schools teach technology as part of the National Curriculum, Unilever, with the National Curriculum Council and the DTI, sponsored a booklet 'Creating the Future'; this was published jointly by the EngC and the Standing Conference on Schools, Science and Technology (SCSST) and was distributed to 25,000 companies after the DES published the Statutory Orders for Technology in 1990. In November the EngC published a seminar report 'Accommodation Resources to Teach Science and Technology in the National Curriculum'.

With regard to careers in engineering for young people, the number of bodies sponsoring a database of the Engineering Careers' Coordinating Organisation (ECCO) had increased during 1988 from seven to ten. Formerly on TTNS and Prestel, the database was moved to Campus 2000. A conference in Glasgow on 'Education, Engineering and Electronics', organised jointly by the EngC, the National Electronics' Council, the Engineering Industry Training Board and the Scottish Development and Industry Council, enabled further schools-industry links to be debated in November 1988. A new careers' brochure 'Engineering for People' (one of the first to be endorsed by ECCO) was tested on young people, advisers and parents and fine tuned during 1989. Consequently 800,000 copies were printed in February 1990 for every 13-14 year-old in the UK and selected pages from the brochure were used to produce posters.

A new four-part book to introduce school leavers and graduates to career opportunities in engineering was published at £5.95 in March 1989 by the Ivanhoe Press in association with the EngC. Termed the 'Ivanhoe Guide to the Engineering Profession' this 192-page book carried a range of articles on the profession in general and the work of the EngC in part one, items on the engineering Institutions in part two, articles on education, training and careers in part three and finally, in part four, a directory of major organisations employing engineers. This useful careers' guide was updated in subsequent years, as we shall indicate in subsequent chapters.

At the primary school level, in February 1989, Ted Howarth of the Devon & Cornwall ECRO, with assistance from DTI, organised a conference in Exeter for primary headteachers, education advisers and teacher trainers. Those present considered the promotion of science and technology in Devon primary schools via communications networks, a package planned to be on line early in the following year.

Two joint statements on careers were issued by the EngC during 1989: 'Careers Education and Guidance within the National Curriculum', with the Institute of Careers Officers and the National Association of Careers and Guidance Teachers, and in May, 'Careers Education and Guidance – Key Issues', with the Society of Education Officers. A series of conferences was organised during the year with other bodies, such as the Independent Schools' Careers Organisation, to inform careers advisers, teachers and lecturers.

The EngC further added to its activities to promote engineering as a career in 1990. To keep teachers, lecturers and careers' advisers updated on promoting engineering as a career, a series of conferences was held in partnership with organisations, including the British Computer Society and the Further Education Staff College.

The 'Opening Windows on Engineering' scheme expanded during 1989. The first 'Train the Trainers' workshop was held at Homerton College, Cambridge, using teachers from the Eastern Region Teacher Training Consortium (ERTEC) – see below. The Rt Hon Mr Kenneth Baker MP, Secretary of State for Education and Science (who had launched the scheme in 1986) presented certificates of recognition to 'Window Openers' at the EngC London offices and others were presented locally. The Institution of Production Engineers included 'Opening Windows on Engineering' in its Career Development Certificate scheme.

All of the proposed projects with schools assumed that the schools had sufficient numbers of appropriately qualified teachers with whom the EngC could cooperate in some way; but the EngC was concerned that this might not necessarily be the case. In fact the EngC had been

the first organisation to alert the country to the shortage of teachers in key subjects. In June 1988, for example, a statement on 'Securing the Future – The Shortage of Mathematics and Physics Teachers' was published jointly with the Headmasters' Conference and the Secondary Heads' Association, following a research report prepared for the three bodies by Professor Smithers and Dr Robinson at the University of Manchester. The report had been commissioned by the EngC because of concern over the possibility that in the proposals for the Core Curriculum science might comprise less than 20%, regardless of Kenneth Baker's wishes. The Junior Minister for Education, Robert Dunn, visited the EngC offices to discuss the joint statement and arranged for his officials to meet the report's authors to examine their findings in depth.

In the following March (1989), the EngC submitted oral and written information to the House of Commons Select Committee on Education, Science and Arts following the publication of 'Securing the Future'. Denis Filer told the Select Committee "Government action has been taken during the last two years but those initiatives have not had enough effect. Drastic action is needed. The EngC believes that the keys to obtaining the right number of teachers of the right quality are: good salaries, appropriate levels of status, and proper resourcing of schools so that teachers have the tools for the job".

To create a new generation of teachers with an understanding of the national economy and of the practices of industry and commerce, six teacher training institutions in Eastern England formed a consortium with the EngC in 1988. This was supported by local Industrial Affiliates and a grant of £50,000 from the Training Agency under its Enterprise in Higher Education scheme. The resultant Eastern Region Teacher Education Consortium (ERTEC) comprised Homerton College, Cambridge, the University of Cambridge Education Department, the University of East Anglia, Essex Institute of Higher Education, Bedford College of Higher Education and Hatfield Polytechnic. Five conferences were held during 1989, each for 50 to 80 employees or representatives of consortia members, students, ECROs, Industry Affiliates, the Training Agency, Local Education Authorities, the National Association of Governors and Managers, the National Confederation of Parent Teacher Associations, Action for Governor Information and Training, and the Society of Education Officers. At the end of this development year, the consortium was awarded a further £1m grant from the Training Agency, spread over 5 years. The total cost of the project was estimated as £2.25m with £1m pledged from educational institutions and £0.25m from industry. This project offered, during the five-year period, to 10,000 student teachers on BEd and Post-Graduate Certificate of Education courses at the six centres in Eastern England, work placements and enterprise experience in industry and commerce. A progress report was published in September 1990. An additional £1m of consortium members' own money was committed and industrial collaboration worth at least another £500,000 was contributed. The ECROs in the EngC Eastern and Chiltern regions became involved in this project.

All this work on the schools' front was soon to be supported by the substantial EngC/Gatsby 'Technology Enhancement Programme' on material resources, as we shall describe in Chapter 5.

Further and Higher Education

Standards And Routes TO Registration (SARTOR)

The Board for Engineers' Registration (BER) spent much of its time in 1988 elaborating SARTOR policies as had been promised in 1985 when the EngC document 'Standards and Routes to Registration' was first introduced. The previous parochial thinking that education belonged exclusively to Stage 1 of the EngC Register and that training belonged only to Stage 2, was modified during 1988 as it became recognised that the outcome of the total formation of Chartered and Incorporated Engineers was a more significant factor. The contemporary attitude was to encourage education and training to be integrated, and also assess prior and experiential learning. In addition, alternative routes to Engineering Technician registration were considered and approved for implementation in 1989.

Despite the EngC's reservations about higher level NVQs, as we identified in Chapter 3, it co-operated with the National Council for Vocational Qualifications (NCVQ) during the year on lower and mid level NVQs in engineering. The EngC clearly stated that it would "consider any relevant NVQ against the criteria required for Stage 1 (education) and Stage 2 (training) registration at IEng and EngTech Levels. The Stage 3 (experience) registration would continue to be a matter for individual assessment by the BER and the Engineering Institutions, as would all three Stages concerned with Chartered Engineers". This stipulation was imposed because NVQs of the levels then available were deemed unacceptable to the EngC for Chartered Engineers.

In November 1989, however, the EngC and the NCVQ issued a joint Statement of Intent declaring a common interest in promoting competence-based qualifications. During the year the EngC had further co-operated with the NCVQ in developments to NVQ Level 4 (equivalent to HNC), helping to introduce a coherent system of post-16 qualifications in which vocationally-based competence received comparable recognition to academic-based competence. With the developments by the NCVQ and others in mind, SARTOR was re-examined in detail and a second edition (SARTOR-2) was prepared for issue. While the general standards were similar to those of the SARTOR of 1985, SARTOR-2 indicated that the BER would recognise NVQs at Levels 1 to 4 for potential IEng and EngTech registration, though existing qualification arrangements for CEng did not require any NCVQ involvement. Level 5 NVQs had still to be debated. SARTOR-2 also included an important new section outlining guidelines on 'Roles and Responsibilities' for CEng, IEng and EngTech Registrants.

In January 1990 SARTOR-2 was published by the BER and distributed to all universities, polytechnics and colleges and also widely sold at £12 a copy. Registrants could buy a copy for £9.50. In November 7,000 copies of the section on 'Recommended Roles and Responsibilities' were additionally printed and distributed. This tied in neatly with the call in late 1990 from Tim Eggar, Minister of State for Education, for NVQs to be introduced into schools. In parallel with this the EngC launched a booklet to show how BTEC courses could lead to industry-recognised qualifications and to registration.

The Integrated Engineering Degree Programme

The EngC, pursuing its remit to broaden and integrate engineering studies, published as a Consultative Document in July 1988, 'An Integrated Engineering Degree Programme

(IEDP): Guideline Syllabuses'. This had been endorsed by the BER and proposed a new type of honours degree in inter-disciplinary engineering, designed to complement existing narrowly-based courses. This degree was to be aimed at students who had not yet chosen a specific engineering discipline, or who could later seek a career in the public service or commerce, rather than in industry or pure engineering. Students of 18 or older with a good range of 'A' levels, including mathematics, but not necessarily the usual sciences, were to be welcomed.

This publication elicited nearly 150 formal responses, mostly supportive. An Industrial Forum was convened to discuss the topic and the outcomes were analysed by a consultant. The Industrial Affiliates suggested that the IEDP should be developed to enable a pilot to be run and a number of universities and polytechnics expressed interest in a pilot scheme. A pre-condition for the IEDP courses being accepted onto the pilot scheme was the integration of theory, practical experiments and project work, all related to applying engineering sciences to real engineering problems. With financial support from the Government, six universities and polytechnics in England and Wales were selected initially; during 1989 the scheme was expanded into Scotland and Northern Ireland with additional support from industry. The first two programmes began in 1989 at Nottingham (Trent) Polytechnic and Strathclyde University with the aid of DTI funding. The progress of the first cohort of full-time and part-time students was encouraging and the Nottingham course was accepted for accreditation by three Institutions.

A progress report on the IEDP was published in January 1990. The first students at Durham graduated this year while courses were in their second year at Nottingham Polytechnic and Strathclyde University. Courses commenced at Portsmouth and Sheffield City Polytechnics and at the University of Wales (Cardiff) and in the following year two more started in Queen's University, Belfast and Southampton. The IEDP courses were well received by most Institutions and some had jointly accredited these courses.

The 'Engineering Applications' requirements of SARTOR

SARTOR stipulated that accredited courses should incorporate provisions to satisfy the Engineering Application requirement – a concept that had originated in the 1980 Finniston Report. Finniston's Engineering Applications EA1 and EA2 had aimed to ensure that engineering was taught as a vocational subject, from the basis of real applications in a business world, rather than being an exercise in engineering science. These ideas formed the EA1/2 Demonstrator Project, which continued to be supervised by the EngC during 1988. The project was sponsored by the Training Agency as a part of its 'Enterprise in Higher Education' scheme. The work, completed in early 1989, involved nine higher educational institutions that were chosen to cover a range of disciplines in both the university and public sector. Institutions with more traditional approaches, as well as those with strongly integrated sandwich courses, were included. The outcome was disseminated in June 1989 at a conference held at the Royal Aeronautical Society's premises. All of the nine higher educational institutions participated, cooperating with industry while team-work, inter-personal skills, and business confidence were fostered. Other partnership schemes, involving BTEC and HND, such as the one operated at Nene College, Northampton (later to become University College Northampton) with a consortium of engineering employers, were also encouraged during 1989.

The EngC Examinations

The Syllabi for EngC Examinations were reviewed during 1988 and modifications proposed that became effective in 1989. In addition, a major publicity campaign was launched in July 1989, using press releases, leaflets and posters, to raise awareness that the EngC examinations were "The Alternative Route to the Academic Standard for Chartered Engineer". This campaign brought in over 6,000 enquiries from the UK alone. During the year more courses were established to prepare students for the examinations. It was determined that from 1990 the EngC examination would be of honours degree standard, to match the raised standards required by SARTOR.

For the EngC examinations in 1990 there were 3,920 candidates at 37 UK and 57 overseas centres, an increase over 1989 of 16% in the UK and 7% in overseas candidates. Courses to prepare for the examination were encouraged, two new ones being planned for Scotland in 1991. In 1992 there were to be two more (Northern Ireland and East Anglia), together with others in Hong Kong, Malaysia, Sri Lanka and Trinidad.

Other Further and Higher Education Activities

The EngC, determined to improve the numbers of undergraduates studying engineering in British universities, published 'Admissions to Universities: action to increase the supply of Engineers' in November 1988. During that year the trustees of the National Engineering Scholarships scheme, following a 1987 agreement between the DES and the EngC, agreed a financial plan to enable the scholarships to be wound up by 1991 as by then the scheme would have served its purpose.

With the National Association of Teachers in Further and Higher Education (NATFHE) the EngC organised, in June 1989, a joint conference for teachers in further education and others interested in skills shortages. The impact of demography and the impact of the 1988 Education Reform Act were analysed, using case studies and other examples. Also during 1989 the EngC cooperated with the Standing Conference on University Entrance (SCUE) and others to make engineering higher education as accessible and attractive as possible to individuals who had vocational and non-traditional qualifications.

The Universities Funding Council (UFC) and the Polytechnics and Colleges Funding Council (PCFC) were set up during 1989, replacing the existing funding bodies - the University Grants Committee and the National Advisory Body for Further and Higher Education. The EngC used this opportunity to update its 1984 policy statement on Resources for Engineering Education; this was undertaken in cooperation with the Committee for Engineering in the Polytechnics, the Standing Committee of Heads of Engineering in Colleges and Institutes of Higher Education, the Standing Conference on University Entrance, the Royal Society of Arts, Industry Matters and the Training Agency. The result was sent as a discussion document 'Restructuring Engineering Higher Education' for comment to the UFC and to the PCFC, with copies being sent also to all higher educational institutions. The associated recommendations on staff:student ratios and on technical and secretarial support and on equipment requirements were welcomed. The EngC, in a cooperative effort with the Engineering Professors' Conference, published a summary of responses to the discussion document in November 1989. All this activity was not in vain as after eight years of decline, there was an encouraging increase in applications for places on engineering higher education courses during 1990.

In January 1990 a conference was organised jointly by the EngC, the Training Agency, the Royal Society of Arts, and Industry Matters for educationalists, employers and professional bodies to debate 'Wider Access to Engineering Higher Education'. The conference was chaired by Sir Christopher Ball, the key-note speaker being Government Minister Tim Eggar. He stated that the "supply of engineers at all levels was vital to the future of the UK economy" and he urged employers and the Institutions to "make engineering more accessible". As a result of this conference 'Engineering Futures', funded by the Employment Department, was published by the EngC in October 1990.

Towards the end of this period a Joint Accreditation Panel (JAP), chaired by Mike Sargent IEng, was established by nine of the engineering Institutions within the Executive Group 2 Committee (EGC2) of the EngC. This joint venture brought together all the civil, water, highways, structural and building services Nominated Bodies that had members who were Incorporated Engineers and Engineering Technicians. The intention was for the JAP to have delegated powers from the Institutions to accredit IEng and EngTech courses on their behalf. The JAP drew up a memorandum of understanding with the BTEC laying down how the two bodies would work together; the concept was for BTEC resources to be utilized while JAP's independence was maintained in accrediting civil engineering courses. Within building services CIBSE retained its own procedures but shared some of its policy decisions and workload with the JAP. An accreditation agreement was approved in 1991 early during John Fairclough's Chairmanship of the EngC.

It is worth noting that on the national scene at this time plans were afoot to allow the Polytechnics to use the "University" title. This soon led to the new universities being able to award their own degrees. Also the separate funding councils, UFC and PCFC, came to be supplanted by the single Higher Education Funding Council (HEFC).

Continuing Education and Training

The working party that had been established as a result of the June 1986 'A Call to Action' paper on Continuing Education and Training (CET) and to which we referred in Chapter 3, comprised employers, providers of CET, engineering Institutions, trades unions, ECROs and engineers and technicians. All had expressed interest in the proposals for individual engineers and technicians to maintain and detail their own personal career action plans using a specially designed 'Career Manager' record book. The workshop held at the University of York, attended by industrialists and educationalists early in 1988 that we also mentioned in Chapter 3, had debated possible pilot schemes to test the viability of these proposals. As a result of this workshop, a conference on 'CET – An Investment for the Future' was organised at Cambridge in September 1988 jointly with the Careers' Research and Advisory Centre (CRAC).

The outcome, under the guidance of the EngC's CET Executive, Chris Senior who had been appointed in May 1988 in succession to Bernard Dawkins, was the introduction in that November of a number of pilot schemes. Chris Senior, a Chemical Engineer by profession, had latterly been dealing with the recruitment, training and development of managers, engineers and other staff in a number of major engineering companies. Over the two-and-a-half years following his appointment to the EngC the pilot schemes involved over 540 engineers and technicians in fifteen fairly large companies. Funding came from the Department of Education and Science (DES) through its Professional, Industrial and Commercial Updating (PICKUP) programme. To monitor and evaluate these pilot schemes a

Steering Committee was established under the chairmanship of Derek Kingsbury, Chairman and Chief Executive of the Fairey Engineering Group. This resulted in the publishing in January 1989 of 'Continuing Education and Training – A National System for Engineering: A Summary of Responses'. This itself was a follow-up to 'Continuing Education and Training - A National System for Engineering' which had appeared in the previous year [see Chapter 3]. There was broad support for the concept but some reservations on the funding implications and the role of Career Action Planning (CAP) advisers. Assessments were made of the usefulness to individuals of the Career Management Document in undertaking CET and associated career development, and the support to them from employers and the professional Institutions.

Also published in March 1988 within the Continuing Education and Training remit was a statement 'Management and Business Skills for Engineers'. This emphasised and demonstrated that many engineers had the potential to become managers and it recommended means by which they and their employers could bring this about to the benefit of their company and the UK.

A workshop was again held at the University of York in May 1989 to discuss the pilot CET schemes and the involvement of the Professional Institutions that had Incorporated Engineers and Engineering Technicians in their membership. It was planned to update existing skills for individuals as well as provide skills for those with few or none. The CET pilot schemes soon attracted nearly 1,000 engineers in 58 firms, thanks to support from the DES and industry; some firms had expanded CET schemes within their own organisations. The pilot schemes were extended to the end of 1990, while the 1,000th participant, Miss Rosie Brooks (23) in the Dowty Group, became involved by October. Denis Filer expressed "this needs now to become a national scheme"; he felt that the Training and Enterprise Councils that had been set up by the Government earlier in the year (see below), could play an important role in this, but the drive should come from industry and individual engineers. As a consequence, another Steering Committee chaired by Derek Kingsbury, involving the EngC, employers, the Institutions and providers, investigated the means to turn pilot CETs into a national system.

To maintain the momentum a conference at Cambridge, 'Investing in Continuing Education and Training – The Engineering Business' was organised in September 1989 by the EngC jointly with the Careers' Research and Advisory Centre (CRAC). As an added impetus to the campaign a statement was prepared, with the backing of the professional Institutions and Trade Associations, arguing that engineers and technicians should be able to claim tax relief for expenditure on CET. In the following year the decision was taken to rename CET as Continuing Professional Development (CPD) and a national system was imminent – "If you don't keep up to date, you'll very quickly become out of date" became the slogan promulgated by Director General Denis Filer.

The case for tax relief for individuals who paid for their own CPD was debated with some vigour at the July 1990 Assembly and then laid out in the document 'Individual taxation – The need for change' published in September 1990 jointly with the Engineering Employers' Federation (EEF), representing some 5,000 companies. The EngC and the EEF claimed that the UK was out of step with leading competitor countries in the tax treatment of professionals' training expenses. The document received the support of 45 Engineering Institutions and Trade Associations and was to be discussed with the Financial Secretary to the Treasury early in 1991. We shall examine the outcome to this in Chapter 5.

By the end of 1990, pilot CPD schemes were involving over 1,000 engineers and technicians in 65 organisations. A policy statement regarding a national scheme was issued early in 1991 and the DES, through its PICKUP programme, provided £280,000 over three years from January to promote a national scheme.

Interfacing Internationally

When Sir William Barlow took over the Chairmanship of the EngC, the single European Act of 1992 was on the horizon, albeit four years away. Within the EngC's Engineering Profession Directorate at this time Peter Hector, a Chartered Aeronautical Engineer from the RAF had taken over as International Executive following the death of Arthur Osley. A great deal of work was necessary now on international matters. With this in mind, 'The Profession After 1992' was chosen as the theme for the Second Engineering Professional Forum on 6 December 1988, when Presidents and Secretaries of the Nominated Bodies met EngC Council members. As a result a joint '1992 Working Party' was set up. Already, by the end of 1988, believing that it would be helpful in preparing for the European Act, 1,330 Britons had applied for the title of European Engineer – as many as from all of the remaining nineteen eligible European countries put together. Part of the reason for this disparity was that other countries did not have a central qualifying engineering organization that was prepared to publicise among engineers the Eur Ing concept.

The constitution of the British National Committee for International Engineering Affairs (BNCIEA) was amended in 1989 to permit Incorporated Engineers to be adequately represented. As we explained in Chapter 2, BNCIEA operated under the aegis of the Board for Engineers' Registration (BER); it represented the Engineering Institutions, the Fellowship of Engineering and the EngC, and was the UK's national member of FEANI. The Annual Assembly of FEANI in August 1989 was hosted by the BNCIEA at Harrogate in conjunction with the International Conference on Engineering Design. Edward (Ted) Houghton, a BNCIEA member, was elected Vice-President and Treasurer of FEANI for three years from that August. BNCIEA members representing the UK attended the 1989 World Federation of Engineering Organisations' (WFEO) biennial conference in Prague and the Commonwealth Engineers' Conference in Nicosia, Cyprus, and members briefed some Institutions, educational establishments and industrial companies on the Single Market Act, 1992.

Following a 1985 proposal by Professor Levy acting as Secretary of the BNCIEA, agreement on the mutual recognition of *accredited* engineering degrees was achieved by the EngC in December 1989 with the relevant accreditation bodies of UK, Ireland, USA, Canada, Australia and New Zealand. This agreement came to be known as the 'Washington Accord' following a preliminary signing in Washington DC. The formal signing took place a year later during the WFEO meeting in Prague. Over the years, as we shall see, the Washington Accord assumed increasing international importance.

The essence of the Washington Accord was that each of the participating countries agreed to recognise the accreditation systems of the others as robust and of an equivalent standard. This meant, for example, that in the UK the engineering Institutions would automatically accept a graduate from an accredited engineering course of any of the other countries as satisfying the Stage 1 (Educational) requirements for registration as CEng.

The agreement needed ratification by each of the partners and each had its own internal problems. For example, in the UK all the Nominated Bodies had to be satisfied. In the USA

the Accreditation Board for Engineering and Technology (ABET) had to get all 50 States to agree to the Accord because the Professional Engineer (PE) title was awarded locally. Likewise in Canada all 12 Provinces had to agree. The other three countries Australia, New Zealand and Ireland had fewer problems because each had a single engineering institution covering all branches and also awarded a national qualification. In the event all six countries ratified the Washington Accord the last one being the USA on 27 April 1990 when the ABET Board of Directors approved the agreement.

Mindful of the 1987 European Accord among 20 countries regarding the FEANI title of European Engineer, there was now an opportunity for full mutual international recognition of engineering qualifications at the Chartered Engineer level as distinct from Stage 1 (Education) only. However, it was decade later that this came to fruition as the 'Engineers Mobility Forum' (EMF) a development of the Washington Accord – which by then included Hong Kong and South Africa, with Japan and Germany seeking to join.

The BNCIEA was extremely active with the DTI in 1989 and 1990 in preparing for the implementation of a European Community Directive for the Professions and a member helped to draft a Directive specific to engineers. As a result, in 1990 the DTI was able to announce that Incorporated Engineers, as well as Chartered Engineers were to be included in the European Community Directive on mutual recognition of professional qualifications. February 1990 saw FEANI publishing the first issue of the *European Engineer*. By the end of 1990 there were nearly 6,000 British engineers on the FEANI Register entitled to use the Eur Ing title. Some 350 Incorporated Engineers were in Group 2 on the FEANI Register.

Representatives of the BNCIEA attended the 1990 FEANI General Assembly in Capri. In the same year the BNCIEA participated in the WFEO's work with the 'UN International Decade for Natural Disaster Reduction' whilst in October 1990 the BNCIEA hosted L G de Steur, the FEANI President, on his visit to the UK.

Interfacing with Industry

Industrial and Industry Affiliates

Sir William Barlow encouraged the holding of more meetings in early evenings at which subjects of significance to the engineering profession were discussed. Industries, through the Industrial Affiliates, were encouraged to become involved in the engineering education of potential employees. Accordingly, during 1988 two special meetings between the EngC and its Industrial Affiliates were held, one to discuss 5-19 liaison, the other to discuss the new Integrated Engineer Degree Programme (IEDP). Both meetings were well attended.

Also during 1988 the EngC arranged for ten regional meetings for existing and potential new Industrial Affiliates to be hosted by well-known companies; at these meetings more firms were encouraged to join the EngC. For companies who had less than 100 employees an additional category within the Industrial Affiliate framework was introduced. Sir William Barlow and Viscount Weir, President of the British Electrotechnical and Allied Manufacturers' Association (BEAMA), jointly wrote to all 375 BEAMA members, encouraging them to join the EngC as Industrial Affiliates. As a result of these efforts thirty-six more firms joined the EngC during 1988, even though affiliation fees, which had been unchanged since 1985, were increased by 10%. By the end of the year there was a total of 210 - and Council decided that from 1989 they would all be styled Industry Affiliates. They

had, however, already [prematurely] been termed Industry Affiliates in the 1988 Annual Report!

Firms that had been involved with the earlier Technical Reviews were revisited in 1988 to assess the longer-term benefits of a Technical Review. Assurances were also sought that technology was being considered by chief executives and boards when they contemplated new products, processes or systems or future skills needs. It was hoped that Technical Reviews could be linked with the DTI's Enterprise Initiatives.

The campaign 'Registration Matters!' was mounted during 1988 to encourage more of those who were qualified to become Incorporated Engineers and Engineering Technicians to seek the benefits of registration, particularly with the imminence of the Single Market in 1992. Considering the Register from another angle, the EngC believed that the appearance of an engineer's name on its Register was a formal indication of competence, and that competent engineers could make a significant contribution in raising the competitiveness of British industry and commerce. Hence, the EngC felt, British industry should be emphasising more vigorously the benefits of registration and should be employing Registered Engineers.

With this in mind, when the Fourth Industry Forum was held in November 1988 the theme chosen was 'Registration Matters!'. Over 100 Directors and Senior Managers from Industrial Affiliates were welcomed at the Forum. A supporting pamphlet and poster were distributed through the EngC's Affiliates. During 1989 'Registration Matters!' leaflets were distributed to relevant members of the Manufacturing, Science and Finance Union and the Engineering Managers' Association in a joint activity between the EngC and these organisations. Feedback from the Affiliates involved in the 'Registration Matters!' pilot scheme helped to identify key issues in encouraging engineers and technicians to join the EngC Register.

By 1989 more employers were requiring job applicants to be Registrants and more were offering to pay employees' Institution subscriptions and the EngC registration fees. During 1990 this practice spread with some 50% of employers paying both their employees' Institution annual subscriptions and the EngC fees as they encouraged or required their engineering staffs to be Registrants. Three further Unions pledged their support for the 'Registration Matters!' campaign in February 1990 – the Electrical Electronic Telecommunications and Plumbing Union, the Federation of Professional Associations and the United Kingdom Association of Professional Engineers. These Unions sent copies of the EngC leaflet to their representatives urging their 360,000 members to consider the benefits of registration with the EngC.

In furthering the links with industry, two regional meetings for Industry Affiliates were held in early 1989, hosted by Rolls Royce Motor Cars Ltd and Pilkington plc. Twenty Industry Affiliates met to discuss the EngC's initiative 'In Partnership with Industry', addressing issues surrounding the future supply of engineers and technicians. Many of those attending voiced possible solutions to the problems identified. The EngC organised another conference in October 1989, chaired by Sir Christopher Ball, a RSA/BP Fellow, also exploring challenges facing the UK in the supply of well-qualified manpower. This was followed, in November, by the fifth annual Industry Forum; 100 directors and senior managers from the EngC's Industry Affiliates heard the EngC presentation 'Building Your Achievements to Date'. At this Forum, a 'Matters of National Importance' proposal was introduced to increase public awareness of engineers' contribution in, and to, society. An 'In Partnership With Industry' paper was also presented, including six guidelines for action by the Industry

Affiliates. The EngC Chairman confirmed these in a follow-up letter, encouraging each Affiliate to participate.

By the end of 1989, 277 Industry Affiliates [an increase of 67 mostly small and medium sized companies over the 1988 figure] had been recruited following a joint approach to trade association members. BEAMA [already mentioned], the Electronic Engineering Association, the Federation of Civil Engineering Contractors and the Association of Consulting Engineers in particular, had been contacted.

The sixth Annual Industry Forum was held in November 1990, attended by over 100 senior representatives from the EngC Industry Affiliates. The main items discussed were the proposed national system for CPD and the formation of an Engineering Occupations' Standards' Group (EOSG) – see below. In the same month a 'Working Together (Industry-Education Initiative)' was published, supporting the campaign begun early in 1990. By the end of 1990 there were 247 Industry Affiliates – a reduction of 30 companies compared with the 1989 numbers, brought about mainly by company mergers and the economic climate.

Other Industrial Activities

A network of Training and Enterprise Councils (TECs) was set up by Government in 1989 to enable local companies to help create relevant local skills bases. Because CEng, IEng and EngTech qualifications were competence based, the EngC's framework was most attractive to the TECs; it provided a measure of existing skills within a company, a means to identify and quantify any additional skills needed, and a yardstick against which new courses could be measured. The EngC, however, needed to explain how industry could benefit by the use of EngC titles. Sir William Barlow wrote to the emerging TECs explaining the EngC's position in setting and maintaining standards of training for engineers and technicians and offered support to meet the TECs' objectives.

The plan for the Engineering Occupations' Standards' Group (EOSG), discussed at the 1990 Industry Affiliates' Conference, was for a national coordination of standards across all engineering disciplines to secure a uniformity of approach and use of nomenclature. It was later realised that this would also be of benefit in allocating engineers consistently to particular sections of the EngC Register. In the event the EngC and the Employment Department, both seeking to avoid the emergence of diverse standards, aided the setting up of the EOSG. However, it was a complicated scenario as most of the former statutory Industry Training Organisations, such as the Engineering Industry Training Board (EITB), had been disbanded by Government legislation. [Although the Engineering Training Authority - ETA - later emerged from the ashes of the old EITB.] The coordination task was, therefore, enormous as some 70 bodies associated with engineering were involved. The Government White Paper 'Employment for the 1990s' had, nevertheless, encouraged the EngC to take an interest in competence-based performance standards and the EOSG offered a suitable opportunity for progress. The Construction Industry Standing Conference was used as a model to form similar broad groups across engineering.

Interfacing with the Public

The Public Affairs staff, led by Ron Kirby in publicising the EngC's aims and objectives during 1989, briefed Members of Parliament regularly, and achieved a 19% increase in references to the EngC in the national media and a 57% increase in provincial press coverage.

Media reporting on the EngC improved also in quality. *The Times* and the *Daily Telegraph* were now regularly publishing formal lists of newly-qualified Chartered Engineers and Incorporated Engineers. The YEB competition was reported by Thames TV, BBC, ITV, Radios 1 and 4 and the BBC World Service. In addition to materials identified above, EngC items published during the year included 'Managing Design for Competitive Advantage' reprinted in March [this had been first published in July 1986] and, in August 1989, the corporate brochure 'Shaping Britain's Future'.

During 1990 there were 2,465 specific mentions of the EngC in the media (a 4% increase over 1989), including magazines for young people, as well as national, regional, and local publications, TV and radio programmes. The YEB competition occasioned the greatest media coverage. Substantial numbers of letters were organised and inspired by the EngC Public Affairs Directorate to the *Daily Telegraph*, *The Times*, *Financial Times* and the *Independent*.

'Engineers and the Environment' was the theme of the sixth Engineering Assembly, opened by the EngC's President HRH The Duke of Kent and held at Surrey University on 16-17 July 1990. David Heathcote-Amery (Parliamentary Under Secretary of State for the Department of Environment), Sara Parkin (Green Party), Sir John Mason (former Director General of the Meteorological Office) and Robert Malpas (Chairman of PowerGen) were among the key speakers. It was announced that the EngC would introduce an Environment Award in 1991 for individuals or teams. A brochure was produced for Assembly discussion and then distributed to all UK secondary schools in December 1990 as 'Engineers and the Environment'.

In part fulfillment of Sir William Barlow's vision for the EngC to play a prominent role in matters of national importance, three working parties, each chaired by an EngC Council Member were set up in 1990 to address further a number of broad issues:

- Engineers and Risk Issues – chaired by Sir William Francis, with members drawn from EngC Affiliates, staff of safety agencies and academics; the final report was to be presented in April 1992.

- Engineers and the Environment – chaired by Professor Michael Burdekin, with members drawn from environmentalists and Government Departments; this working party was also to keep in touch with any environment activities of the Institutions. The EngC responded in 1990 to the Government's Environment White Paper.

- Registrants and Industry Affiliates – chaired by Michael Manzoni; this working party was charged with looking at means to increase registration, through the Industry Affiliates, and by building and expanding on the existing links thereby ensuring a supply of properly qualified engineers and technicians to meet the country's needs. A report was due at the end of 1991.

Fourteen Members of the Parliamentary Group for Engineering Development [five Peers and nine MPs] visited the EngC's offices in March 1990 while key MPs and peers were supplied regularly with EngC literature throughout the year. During the year the EngC made a strong statement on the future of the UK Civil Nuclear Programme.

The Award for Industrial Innovation and Production

In May 1988 the EngC published 'Innovators Need More Than Ideas' as a handbook for industrial and business innovators. It contained a foreword by His Royal Highness The Prince of Wales in his capacity as Patron of the 'Award for Industrial Innovation and Production'. The original long-term aim of the Award was to encourage contestants to take their businesses forward into production. The handbook was distributed through the auspices of Business in the Community, the British Venture Capital Association and the UK Science Park Association. Copies were also sent to the Small Firms Service of the clearing banks. The 1988 presentations for the Award were made, as in 1987, by HRH Prince Charles at Highgrove House. Surgeon David Sharpe, the winner, had invented a plastic surgical retractor. The ceremony was shown, also as in 1987, on BBC's Tomorrow's World. During the year a group of venture capital firms supported the Award financially.

Finalists in the Prince of Wales Award for Innovation and Production in 1989 were again hosted by the Prince at Highgrove House, and filmed by Tomorrow's World. Drs John Holian and John Edwards of Amersham International plc won the Award for 'Amerlite', an invention based on horseradish to help doctors diagnose cancer, thyroid disorders and pregnancy abnormalities. The Award was henceforth administered by Business in the Community. In 1990 the EngC gave evidence to the House of Lords Select Committee on Science and Technology, exhorting more Government support for innovation.

EngC Staff Changes

A number of personnel associated with the EngC changed towards the close of the 1988 to 1990 period. Early in 1990 the EngC recruited Miss Pattie Mee as a Partnership Manager (funded for a year by DTI in conjunction with Business in the Community, to promote its Enterprise and Education Initiative with companies) to bring companies, schools and colleges closer together.

Graham Anthony, Director - Industry and Regions, who took early retirement in 1990, writes:

"Frank Tombs and Kenneth Miller had the foresight to integrate (school) Education into my Industry Directorate. We had a springboard to support 'Problem Solving in Primary Schools' and to proselytise the major work we did with 'A Call to Action' which established continuing education and training as a fundamental ingredient to today's engineering knowledge.

"The initiative which gives me most satisfaction is 'Neighbourhood Engineers'. Both the Affiliates and the ECROs readily embraced this scheme as a practical way of helping our schools develop their technical skills. I worked very hard in the ECROs because their activities crossed all the traditional boundaries, and could potentially have been a real unifying force at the grassroots".

At the beginning of 1990 another industrialist, Perry Goodman BSc, MICeram, FRSA, Head of the Electrical Engineering Branch of the DTI, took over from Graham Anthony as Director - Industry and Regions. Perry Goodman had been Scientific Counsellor at the British Embassy in Paris and then involved in British Government design policy and advisory services for industry. Within the private sector his work had included research, development and process control on refractory materials.

A further change occurred on 3 August 1990 when Professor Jack Levy retired as Director - Engineering Profession and was succeeded by Professor Keith Foster MA, PhD, CEng, FIMechE, Head of the Department of Mechanical Engineering at the University of Birmingham. By request of the Council, Professor Levy had stayed on two years beyond the normal retirement age of 62. As the Director responsible for engineering education and training and for the profession, he had been responsible executively for numerous initiatives including SARTOR, the IEDP, and the international negotiations leading to Eur Ing and the Washington Accord.

Sir William Barlow's Departure

At the Council Meeting in May 1990, HRH The Duke of Kent paid tribute to Sir William Barlow's efforts to bring to proper focus the EngC's relationship with the Engineering Institutions, industry and individual engineers. Whilst this was Sir William's last official meeting at the EngC, he actually continued to the end of 1990. When he finally retired from the Chairmanship, Sir William Barlow had considerably increased the prestige of the EngC in all its important partnerships – schools, universities, industry and international affairs – and he had improved the EngC's visibility in the public domain. Working closely with Denis Filer, the Director General, relationships with the Engineering Institutions had also moved in the right direction. And although he had been impeded in his wish for the EngC to comment on matters of national importance, Sir William had nevertheless ensured that several such contributions had been made. However, he later reflected:

"I felt we were gradually making real progress but I have to say that of the various Chairman offices I have occupied I found the Engineering Council one somewhat unsatisfying because of the constant parochial and unnecessary arguments with the Institutions and for that reason I decided to give it up as soon as I could. Ten years later the Engineering Council still had some of these problems and was still struggling to be the voice of the Engineering profession. It deserved better support from the profession."

With hindsight it may seem that the end of 1990 marked a high-water mark in the progress of the EngC. Subsequently the momentum achieved since 1982 was not maintained in all its activities. The reasons for this will emerge in the following chapters.

Chapter 5 – 1991 to 1995 : The Fairclough Years

A New Relationship

The Fairclough Initiative

On 1 January 1991 Sir John Fairclough, BSc(Tech), HonDSc, HonDTech, FEng, FIEE, FBCS, took over the Chairmanship of the EngC from Sir William Barlow. Sir John was Chairman of Rothschild Ventures Ltd, Centre for the Exploitation of Science and Technology, Systematica Ltd., Director of Oxford Instruments Group, and Non-Executive Director of UAPT-Infolink, The Generics Group. He knew the EngC situation well having served on its Council since its inception and during his five years as Chairman from 1991 until 31 December 1995 his major aim – indeed, his mission - was to unify the profession and to raise its profile in Europe and worldwide.

Sir John immediately made it clear that he intended to re-examine the goals and objectives of the EngC. He outlined his proposals in an EngC paper 'A Strategy for the Engineering Council' in which he advocated a focussed umbrella body empowered to set professional standards and coordinate the interests of a federation of learned societies. Despite the EngC's evident successes, Sir John felt strongly that the major reason for its failure to be, and failure to be seen to be, the focal point for the Engineering Profession was it being a Chartered body, and not the statutory Engineering Authority originally recommended in 1980 [as we explained in Chapter 1] by Sir Monty Finniston. Any hopes of support from that source were dashed when Sir Monty died in early February 1991 at the age of 78; many EngC staff attended a memorial service held in north London remembering "Monty" as a major link in the chain of events leading to the original formation of the EngC.

Sir John Fairclough's personal commitment to the unification mission was so clear that it soon became termed the Fairclough Initiative. Some colleagues even believed that his vision was overshadowing all else. In fact, the Director General Denis Filer, who had served loyally throughout the term of the previous Chairman, felt it necessary to point out in the 1991 Annual Report that whilst the unification issue had taken centre stage, excellent progress had been made in other key areas of the EngC's work such as:

- Review of Engineering Education and Training:
- Continuing Professional Development
- Engineering Occupational Standards
- Neighbourhood Engineers
- Women Into Science and Engineering
- Matters of National Importance
- Restructuring of the Regional Organisation
- The Campaign for Tax Relief

We shall return to these activities that took place during the 1991 to 1995 period under appropriate headings later in this chapter, but let us first review the Fairclough Initiative.

Sir John visualised a *new single overarching body*, to set standards and speak with one powerful voice for the profession, if necessary subsuming the EngC. To the 5th Engineering Professional Forum in November 1991 he gave the theme 'Unification of the Profession' and made a presentation on this during the Forum. His concept was taken a step nearer on 15 January 1992 at a meeting of Institutions' Presidents who endorsed the formation of a Steering Group to investigate the role and responsibilities of a single body. An interim report

was to be presented on the first stage of progress to a further meeting of the Council of Presidents early in 1993. This Council required that the proposed single body should:

- be self-regulatory, although statutory powers were to be considered;
- have a centralised role only for those activities best performed at the centre;
- coordinate and optimise the use of resources while enabling the constituent parts to maintain and develop their specialised knowledge of the engineering disciplines.

It was considered that mergers between Institutions would be natural, not forced, indeed the Institutions should retain their chosen identities within the new body. This was a departure from previous policy [and stated in the EngC's Aims and Objectives – see Annex E] of actively promoting mergers between Institutions.

Such a menu proposed by the Council seems unexceptionable enough but as so often in Nfederal issues, the devil was in the detail.

The Steering Group members were:

Sir John Fairclough FEng FIEE FBCS Chairman
Ted Bavister CBE FEng FIChemE (Vice President, IChemE; Chairman and Chief Executive, John Brown Engineers & Constructors Ltd)
Professor Duncan Dowson CBE FRS FEng FIMechE (Deputy President, IMechE; Head of Department of Mechanical Engineering, Leeds University)
Major General Malcolm Hutchinson CB CEng FIEE FIEEIE (President, IEEIE)
Brian Manley FEng FIEE (President, IEE; Council Member, Fellowship of Engineering; Managing Partner, Manley Moon Associates)
Rear Admiral Mike Vallis CB FEng FIMarE (President, IMarE; Director, Darchem Ltd; lately Director-General of Marine Engineering, MOD)
Robin Wilson FEng FICE (President, ICE; lately Chairman of Travers Morgan Consulting Group; Member of the EngC)
Barbara Stephens IEng MIEEIE MBIM (Industrial Adviser, National Economic Development Office; Member of the EngC)
Geoffrey Marsh MBE MCGI IEng FIOP (Past President, IOP; partner in a product development consultancy)
Sir James Hamilton KCB MBE FEng (formerly Permanent Under Secretary of State at the DES) was appointed by the Group as an executive member responsible for research and secretarial support.

It is noteworthy that whilst the Group members had a combined healthy mixture of industrial, academic and Government expertise, they were chosen because of their voluntary positions within the engineering Institutions. So what emerged was very much an Institution-oriented development with all the advantages and drawbacks that implied.

The Unification Steering Group met ten times in 1992, aptly identified by Sir John Fairclough in the annual report as "a year of considerable challenge for the EngC and for the profession as a whole". The views of many Institutions and of individual engineers on unification were also received while Sir John suggested a "Royal or National Institution of Engineers as the backbone of the profession". "We must not shrink from the need and desire for more radical change", he added.

However, when the Interim Report at the first stage of the Unification Steering Group's work was published in April 1993 as 'Engineering into the Millennium', it was clear that the

concept of a single overarching body had been significantly modified. Instead the Report proposed a two-tier structure comprising:

1. A central body which Council members would have the majority of members elected by individual engineers.
2. A grouping of Institutions into colleges *which would be the principal source of advice to the Council* [our italics.] [As will be seen later, this provision was scuppered or ignored.] There was wide support for such a structure to enable the profession to speak and act collectively whilst permitting each Institution to develop its own specialist interests within a framework of mutual cooperation. Sir John himself had strongly backed moves for a single-body solution, and when the Interim Report was formally presented at the 9th Engineering Assembly, held 19/20 July 1993 at the University of Nottingham, the Assembly theme was publicised as 'Unification of the Engineering Profession', just as though all was going to plan.

In the event, the 1993 Assembly agreed on the need to proceed to a second stage of activities. A Stage II Policy Group was set up under the Chairmanship of Sir John, comprising senior representatives of a number of Institutions and five members of the EngC Council. This Group, which held its first meeting on 27 September 1993, was charged with establishing a proposal for a "New Relationship" to be considered in the Autumn of 1994 with the intention of electing a reformed Engineering Council in June 1995. A progress report was presented in July 1994 at the 10th Engineering Assembly held at Churchill College, Cambridge. It was announced that the reformed EngC would have an *elected* Senate (replacing the appointed un-elected Council) and two Boards – one for the Profession and one for Regulation. We outline in the next section the finally agreed membership and responsibilities of these Boards.

The second stage report of Sir John Fairclough's Initiative, a Unification Consultative Document, was published on time in October 1994.

Institution Working Groups and committees (some reporting to the Board for the Engineering Profession, others to the Board for Engineers' Regulation) were set up in 1995 by the Policy Group of the Unification initiative to address:

1. A revised Charter and Bye-laws with schedules to accommodate the next points 2, 3, and 4.
2. An election process for the new Senate.
3. Working arrangements for the new Board for the Engineering Profession.
4. Working arrangements for the new Board for Engineers' Regulation, including subsuming the existing Board for Engineers' Registration.

On 21 February 1995 the EngC and all but one of the 40 Institutions signed a Declaration of Intent to support the establishment of a new body to "unify" the Engineering profession. The EngC agreed to seek Privy Council approval for changes to its Royal Charter to enable new arrangements to be put into place. The vesting day for the new body was chosen as 1 January 1996. Although it fell short of his original vision Sir John claimed "This excellent outcome exceeded my expectations and will radically alter the relationships between the EngC, the Institutions and the Registrants. For the first time the EngC will comprise engineers all democratically nominated and elected by the Institutions and Registrants". Whilst this was true, the actual effect was to give the Institutions much greater leverage on the EngC than they had hitherto enjoyed, as can be seen from the make-up of the Senate given below.

The unification initiative was not cheap; its costs were shared 50:50 between the EngC and the Institutions, the largest element, by far, being the election process, although it was agreed that the expense of future elections would be born by the EngC. Because of these costs expenditure on new initiatives and particularly on regional projects had to be held in abeyance during 1995.

The Privy Council approved the EngC Petition for a Royal Supplemental Charter and Bye-laws on 7 December 1995 and the Supplemental Royal Charter was issued on 24 January 1996.

Senate and the Two Boards

The new internal structure is shown in Fig.7. However, it was recognised that not all of the requirements of the Supplemental Royal Charter could be implemented immediately.

For the longer term the Supplemental Royal Charter required the 54-member Senate to comprise:

(a) Twenty-four members who were voting Registrants and elected by voting Registrants.
(b) Twenty-four members who were voting Registrants and who were, or had been, either present or past members of the councils of the Nominated Bodies and who were elected by the governing bodies of Nominated Bodies.
(c) Up to six members who were appointed by the Privy Council, one of whom was a Fellow of the Royal Academy of Engineering.

Pivotally, item (b) gave the Institutions, for the first time, a direct voice in the ruling body of the EngC. In an ideal world this may not have disadvantaged the Profession, since the elected members were to still sit as individuals rather than as representatives. But in practice the new system gave the Institutions the power to control the activities of the EngC when it came to interpreting the EngC having "a centralised role only for those activities best performed at the centre".

Senate was to endeavour to ensure that its chairman and other members together reflected a regional distribution. Members, who became termed "Senators", were to provide a reasonable balance among those with experience and knowledge of the major areas of industry, significant engineering disciplines and their respective learned societies, those concerned with the education and training of potential Registrants and individuals from all three sections of the Register. Voting to determine the membership of Senate in categories (a) and (b) was to be on the basis of a 'College' structure of 4 colleges comprising clusters or groups of Institutions as listed in Annex F [very similar in composition to the, albeit five, Executive Group Committees]. The Registrants within each College were to elect 6 members of the new Senate according to a complex formula depending upon the sizes of College membership.

This College structure, originally proposed in the Unification Steering Group's report 'Engineering into the Millennium', had now been effectively watered down to the point where its only function was to facilitate the election procedure to Council. Previously, it will be recalled, 'Engineering into the Millennium' had envisaged the Colleges being "the principal source of advice to the Council". Such formal collaboration was not to the taste of some Institutions that wished to retain complete independence of action while being able,

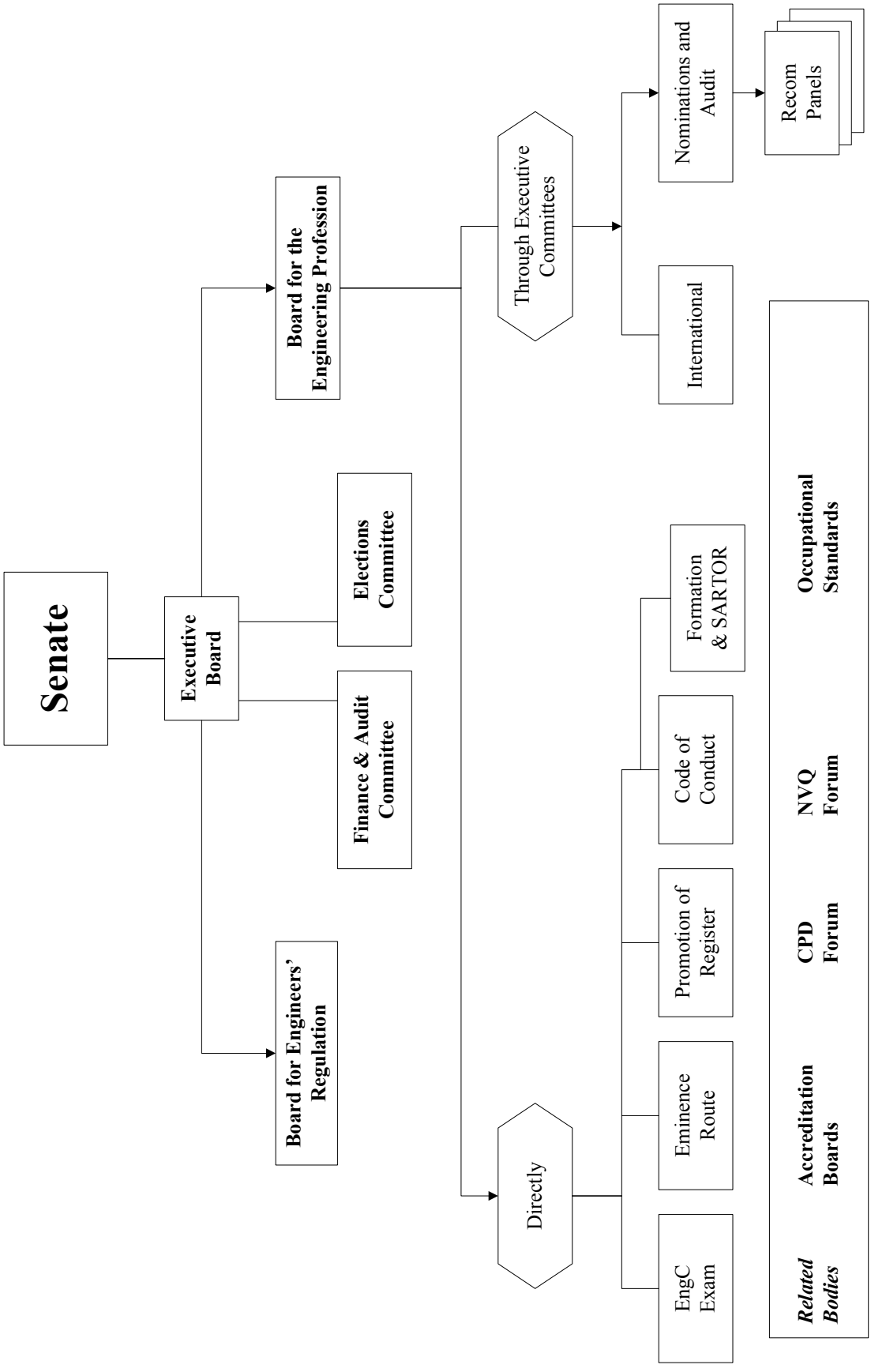

Fig. 7 New Relationship Structure

through the election procedure, to effectively have representatives on the Council, thereby destroying the independence enjoyed by the original EngC.

For an interim period, 64 individuals were chosen to sit on the new Senate. 32 were directly elected by the Registrants and by Institutions, 16 from the old Council and those intimately involved in unification, and 6 nominated by the Privy Council. It later transpired that the composition of Senate with its cumbersome election procedure resulted in a body that was too large and unwieldy.

The two Boards, which had been carefully thought out, reporting to the Senate were the Board for Engineers' Regulation and the Board for the Engineering Profession.

The Board for Engineers' Regulation was to look after education and training and CPD and maintain the EngC Register. It was to comprise:

- eight Senate Members elected to Senate by the councils of the Nominated Bodies
- up to eight Senate Members not falling within this description.

In more detail, this Board was given responsibility for:

(1) maintaining and promoting the Register of chartered engineers, incorporated engineers and engineering technicians;
(2) setting the standards of academic achievement, competence and commitment for those seeking registration;
(3) determining the extent to which Registrants should undertake continuing professional development;
(4) determining codes of conduct to be followed by Registrants;
(5) certifying Engineering Institutions as Nominated Bodies able to both assess candidates for registration against standards and criteria, and regulate the conduct of Registrants;
(6) licensing nominated Engineering Institutions either individually or jointly;
(7) *inter alia*, approving criteria or qualifications which recognised competence in the workplace and/or accrediting educational programmes;
(8) auditing and monitoring the performance of Engineering Institutions in their role as Nominated Bodies and in respect of functions for which they may be licensed;
(9) monitoring the regulation by nominated Engineering Institutions of the conduct of Registrants and the disciplinary procedures of these Institutions which relate to Registrants;
(10) representing the engineering profession on matters which relate to the international recognition of United Kingdom engineering qualifications;
(11) representing the engineering profession on matters which are relevant to the teaching of engineering in schools and further and higher educational establishments and which reflect the needs of engineering;
(12) arranging for the EngC's own examination of academic standards for registration.

Broadly speaking these were the duties hitherto fulfilled by the original Board for Engineers' Registration. So not much change there, although in the interpretation and application of the Royal Charter and Bye-Laws there was the opportunity for much greater flexibility and room for innovative change – which was later used by the Nominations Committee to the advantage of both the EngC and the Institutions [see below]. However, item 10 at last

formally recognised the EngC as the UK body responsible for international recognition of qualifications.

The Board for the Engineering Profession was to implement activities in the UK on matters affecting the whole engineering profession. It was to comprise:

- sixteen Senate Members elected to Senate by the councils of the Nominated Bodies
- up to four Senate Members not falling within this description.

In more detail this Board was given responsibility for:

(1) developing, in conjunction with the Engineering Institutions, the system for:
  (a) commenting publicly and advising the United Kingdom Government on common issues;
  (b) promoting the role of engineers and engineering in society for the public benefit;

(2) maintaining strong and effective links between educational organisations, industry, the engineering profession and the public in order to enhance both the number and quality of those entering the engineering profession and the technological awareness of society;

(3) encouraging the further cooperative development of regional activity on engineering matters in the United Kingdom;

(4) maintaining a relationship with industry and commerce in order to ensure that the engineering profession meets the needs of society;

(5) promoting and managing, for the purposes of the EngC's Charter, joint ventures between the EngC, participating Engineering Institutions and others;

(6) promoting, amongst employers and employees, the benefits of continuing education and training in all relevant skills.

Again this reflected broadly the activities of the previous Industry and Regions Directorate – but now, within the new governing structure the Institutions were involved.

Both Boards had also to prepare annual budgets and financial plans for approval by the Senate and could be required by Senate to perform any other relevant functions.

It may be useful to note here that to reflect these changes the job titles of the EngC staff Directors who provided support to the two new Boards were changed, although this caused not a little confusion. Prior to 1996 the Director Engineering Profession (Professor Keith Foster) looked after the Board for Engineers' Registration, the five EGCs and the Nominations Committee, while the Director Industry and Regions (Bob Eade) looked after industrial and regional affairs, WISE and similar activities. After 1996, Professor Foster's job title was logically changed to Director Engineers' Regulation, whereas the title Director Engineering Profession was used as a replacement for Director Industry and Regions because that Director (Bob Eade and then Brian O'Neill – see later) supported the Board for the Engineering Profession, though continuing to care for industrial and regional affairs, WISE and all similar initiatives.

The new revised Royal Charter also provided for an Annual Engineering Conference [to replace the Engineering Assembly] at which Senate would make available its annual report and accounts. The Conference would have no executive powers but could pass resolutions for the attention of Senate relating to any matter relevant to the activities of the EngC.

On the face of it the remits of the two new Boards should have encouraged significant beneficial change in the operation of the EngC. However, the success of the Fairclough initiative ultimately depended upon whether the Institutions - with their new influence in the Senate - would allow the two Boards, particularly the BEP, to fulfil their duties effectively.

As a consequence of the new Board structure, the final meetings of the Executive Group Committees (EGCs), the two Coordinating Committees and of the Board for Engineers' Registration [see Fig. 2] took place in October and November 1995. In anticipation of the reformed EngC and new procedures coming to fruition, the EngC Membership Department forged closer links with the Institutions and devised improved procedures for the Nominations Committee to audit the registration, accreditation and membership processes. The Nominations Committee, in turn, prepared new nomination and compliance regulations and 18 reviews of Nominated Bodies were conducted by this Committee during 1995. Recruitment and training of a team of volunteer Engineering Council Representatives, to assist the Institutions and improve the audit process, assumed a higher profile during 1995. This part of the new arrangements got off to a good start.

The 11th [and last] Engineering Assembly was held at Exeter University in July 1995. The theme was 'Action for Engineering' which echoed the DTI's initiative of the same name. Dr David Evans (Head of the DTI's Technology and Innovation) closed the Assembly. Thereafter the Assembly was replaced by an Annual Engineering Conference, the first being held in September 1996.

Rent for office accommodation in the Aldwych area of London fell markedly in 1991, so nearby offices were sought for the EngC's satellite operations, the Chairman's initiatives, and the Central London ECRO and EOSG support, which we describe below. During 1992 two floors in Essex House in Essex Street, neighbouring the Maltravers Street offices, were secured on a lease. The Membership Department moved in from the offices that had been rented from the IEE in Savoy House and the IT Department expanded at Essex House to look after the EngC's increasing computing needs. In Essex House, an IBM RS6000 computer system to serve the whole EngC replaced two separate systems that had been used for word processing and the EngC's Registrant Database.

Interfacing with the Institutions

In parallel with the Fairclough Initiative, existing and new activities were vigorously pursued. The EngC continued to encourage mergers among the Institutions. During 1991 the Institution of Production Engineers changed its name to the Institution of Manufacturing Engineers and then, after a failed attempt to merge with the Institution of Mechanical Engineers, merged with the Institution of Electrical Engineers retaining the IEE name. The Institute of Marine Engineers and the Royal Institution of Naval Architects agreed to proceed with merger discussions, although over ten years later they remained separate but in an amicable relationship. By the end of 1991 there were 46 Nominated Bodies, the EngC Nominations Committee having completed the review of the 12 bodies outstanding from their 1990 work, and two Professional Associates as in 1990 [see Chapter 4].

The Institute of Metals changed its name to Institute of Materials on 1 January 1992 in anticipation of a merger with the Institute of Ceramics and with the Plastics and Rubber Institute later in the year. The Minerals Engineering Society and the North East Coast Institution of Engineers and Shipbuilders ceased to be Nominated Bodies in May and July

1992 respectively. The Association of Consulting Engineers became the third Professional Associate of the EngC. In December 1992 the helpful booklet 'A Guide to the Engineering Institutions', containing succinct details on all the engineering Institutions associated with the EngC, was re-published.

So at the end of 1993 there were 42 Nominated and Institution-Affiliated Bodies recognised by the EngC. The Institution of Works and Highways Management merged with the Institution of Civil Engineers on 1 April 1994 and the Hong Kong Institution of Engineers left the EngC in that Summer to form its own accreditation board, in anticipation of Hong Kong becoming a Special Administrative Region of the People's Republic of China on 1 July 1997. The position of the Professional Associates was reassessed in 1994 by the Nominations Committee which drew up new criteria and decided that Learned Society Associate was a more appropriate title for bodies such as these. In 1995, the Institution of Mining Electrical and Mining Mechanical Engineers merged with the Institution of Mining Engineers, and the Institution of Water and Environmental Management was awarded a Royal Charter and changed its name to the Chartered Institution of Water and Environmental Management. At the end of 1995 the number of Nominated Bodies had dropped to 39 as a result of the reorganisations of Institutions described above.

The EngC staff continued developing links with Institution branch officers and set up a web-site in 1995, with links to all Institutions' web-sites and full e-mail facilities for all staff. A Working Group on IT, reporting to the newly-formed BEP, was established during the year to act as a forum for Institutions to exchange information and discuss further IT activity. The new Director General, Mike Heath, appointed in mid-1995 was largely responsible for ensuring that the very latest innovations in IT were introduced throughout the EngC.

Interfacing with the Registrants

The Regional Organisations (ECROs)

The volunteer Regional PROs [who had been appointed in 1990] helped to promote EngC events in the regions during 1991. At the same time the EngC Regional Organisation was restructured, and revised EngC regional boundaries, to coincide with local authority boundaries, were introduced on 1 January 1992, with eleven Administrative Centres opening in July 1992 to support the nineteen ECROs. This necessitated the Neighbourhood Engineers' scheme being redefined and CPD Advisers being re-deployed. The SCRA and the ECROC merged to become a new SCRA. The 1991 annual election to the Engineering Assembly had to be postponed to the Autumn of 1992 to resolve the anomalies created by the boundary changes. To accommodate this situation all Assembly members were offered an extension of one year to their terms of office.

In 1994, as the later stages of the Fairclough Initiative were being finalised, attention was restored to outstanding issues when regional engineering centres were developed by the EngC with the Institutions and complementary organisations. The centres were envisaged as being locally owned and financially independent, providing a focus for educational initiatives and professional development. The Northern Engineering Centre had been established for some years, and one for Wales had been set up in 1994. Exploratory talks were held elsewhere with the Branch Chairmen of the Institutions. Officers in the ECROs recognised that there was a need to retain the ECRO Board as a strategic forum and a facilitator for the profession in a region.

An Institution Working Group on Regional Affairs, Chaired by Dr John C Williams, Secretary of the IEE, was set up in 1995 to examine a potential structure, roles and responsibilities for a possible nationwide regional organisation covering all the Institutions. Although well intentioned, unfortunately this was to end in disaster as we shall explain later.

The Register and Communications

At the beginning of this 1991-1995 period, the EngC's staff and Registrants continued to think and look outwards and the 7th Engineering Assembly, held at Lancaster University on 22/23 July 1991, bore the theme 'Europe into the Next Century'. There were four keynote speeches and at the conclusion a formal statement on 'Opportunities for British Industry in Europe' was approved, urging British companies to grasp opportunities offered by the Single European Market. A Registration-Industry Affiliation Working Party, set up this year, developed a strategy for recruitment of individuals and companies. A recruitment drive was scheduled for launch in 1992.

Registrants' fees were confirmed in 1991 as free from VAT by HM Customs and Excise. 'The Ivanhoe Guide to the Engineering Profession', first issued in 1989, as we saw in Chapter 4, proved so popular that it was published again in association with the EngC, though now by Charles Letts with 226 pages at £9.95 - first in November 1991 and then in November 1992, October 1993, October 1994 and October 1995 as year books for the subsequent year. Despite a change in publisher from 'Ivanhoe', its familiar title was retained as one in the series of guides to professionals such as Chartered Accountants, Actuaries, and Chartered Surveyors.

The regular series of surveys of engineers' salaries and activities that had been inherited from the CEI continued in April 1992 with the same title as in 1989, *viz*, 'Survey of Chartered Engineers, Incorporated Engineers and Engineering Technicians' and now priced at £130. It may be recalled that the first Survey published by the EngC in 1983 sold for £15. The 1992 Survey showed that engineers' pay continued to increase at a rate in excess of the Retail Price Index and of the Average Earnings Index. It also showed that nearly three-quarters of engineers were undertaking some form of CPD - as we explain in more detail below. Overall the survey concluded that the profession as a whole combined financial rewards, intellectual challenge and a determination to keep pace with current developments. Then, after a three-year break, the survey next appeared in October 1995 with the modified title "Survey of Professional Engineers and Technicians" and sold for £95. The survey, now undertaken by Electoral Reform Ballot Services, again showed positive attitudes and improved salaries for engineers. Indeed, since the previous survey the average salaries had again increased by more than the rate of inflation over the same period. Extracts from the survey were reported in the *Daily Telegraph*, *The Independent*, *Daily Mail*, *Financial Times*, trade magazines and Institution journals.

The introduction of an attractive and advanced web site, hyper-linked to all related bodies was another key step in modernising the EngC image and practices, useful not only to Registrants but also anyone seeking more information on the profession of engineering. Nevertheless, portraying the advantages of Institution membership and registration with the EngC was always a problem area. Council member James McHugh wrote:

"I became actively involved with the work of committees and advisory groups. One committee with which I was involved set out to improve the recruitment of Registrants.

While a series of proposals were made, we found that we could not provide a convincing response to the question which came up, with unfailing regularity, from potential Registrants: 'What is in it for me?' We never formulated an adequate and acceptable answer."

Sales of EngC items initially dropped during 1991. However, new products were developed and introduced in the following year. The structure for a separate Trading Company within the framework of the EngC was planned and a special Visa credit card for Registrants was introduced in collaboration with the Beneficial Bank.

The Royal Academy of Engineering

Back in February 1976, on the initiative of HRH The Prince Philip, Duke of Edinburgh and a group of distinguished engineers, the Fellowship of Engineering had been founded as a multi-disciplined body under the auspices and Charter of the CEI, to act for the benefit of engineers, engineering, and society as a whole. It was felt that a prestigious body of engineers should be created in order to represent and further the understanding and professional knowledge of engineers across the whole spectrum of their activities. The inaugural meeting was held at Buckingham Palace in June 1976. The 126 founder Fellows, all Chartered Engineers, were either engineering Fellows of the Royal Society, or Chartered Engineers considered by the engineering Institutions to be the most eminent in their professions. Those within the Fellowship of Engineering were entitled to use the designatory letters FEng. Membership was limited to one thousand.

In 1983, at the dissolution of the CEI, following the creation of the EngC, the Fellowship of Engineering, which had always acted independently anyway, ceased to continue under the wing of the new body but was granted its own Royal Charter in May. The use of the post-nominal letters FEng had caused some confusion, some Fellows using FEng in addition to CEng, others using FEng in preference to CEng; other Fellows, believing that CEng indicated a "professional engineer", the preferred CEI term in any case, rarely added FEng after their names, much to the disappointment of their colleagues.

In March 1992 the Fellowship of Engineering's Royal Charter was revised in anticipation of its change of title in July 1992 to The Royal Academy of Engineering with the gracious consent of Her Majesty The Queen. Initially the Fellows continued to be designated FEng, but in 1999 the practice was altered and Fellows thereafter used the post-nominal letters FREng, thus removing any conflict, perceived or real, with CEng. Whilst the aims of the Fellowship, which were taken on by the Academy, were totally compatible with Sir John Fairclough's unification mission, it is interesting to observe that none of Sir John's published statements on unification, nor any debate on it, appears to have considered incorporating the Academy within the "reformed" EngC – and yet there was always a majority of Fellows on the steering groups or committees who could have implemented this if they had wanted to. Maybe unification, after all, had its boundaries!

Notwithstanding, the Royal Academy of Engineering, which acted as the national member of the international Council of Academies of Engineering and Technology Sciences, maintained close ties with the EngC, having many common goals. One of the major activities of the Royal Academy of Engineering continued to be the funding and administering of schemes to assist engineers in gaining experience nationally and internationally and to promote engineering in both industry and academic circles.

Interfacing with Schools

In the period 1991-1995 considerable and sustained progress was made in the field of schools' liaison under the auspices of the EngC's Board for Industry and Regions operating through its General Education Committee.

'Engineering Equals for Primary Schools' was published in January 1991 and the results of a national survey 'Gender, Primary Schools and the National Curriculum' were published in May 1991 by the EngC jointly with the National Association of School Masters and the Union of Women Teachers; these results showed that of 256 boys and 247 girls aged five, car repairs and woodwork were judged to be the province of men while mending and washing clothes remained the domain of women – in other words, 5 year olds in 1991 had the same perceptions as their parents and grandparents. Among the survey's recommendations were for more people with good science qualifications to teach the youngest children.

In supporting school educational reform in 1991, the EngC helped develop many projects and activities. These included the Technical and Vocational Educational Initiative (TVEI), science and technology curricula, teacher supply, YEB, WISE, Opening Windows on Engineering and the Neighbourhood Engineers' scheme. The EngC also evolved a structure of industry-based standing conferences to develop occupational standards leading to NVQs. This work was coordinated by the EOSG, its secretariat co-located with EngC staff.

During 1991 the EngC again commissioned Professor Alan Smithers and Dr Pamela Robinson from Manchester University School of Education. This time the purpose was to research the impact of local management of schools and of the National Curriculum on previously known strategies of mathematics and physics teachers. The results, reported in 'Staffing Secondary Schools in the Nineties' in that August, revealed the concern from head teachers over never-ending modifications to the National Curriculum and a continuing staff shortfall in both technology and modern languages. This was a saga with a long history and a long future!

The EngC had joined the Teaching AS a Career (TASC) unit - a joint initiative of the DES and two local authority associations - to encourage young people to develop practical skills, knowledge and understanding. Consequently, a brochure 'Your Future in Technology Teaching' was published in January 1991, aimed to help recruit more technology teachers. Michael Fallan, Parliamentary Under Secretary of State at the DES who launched this booklet said "I wholeheartedly support this example of cooperation between The Engineering Council and TASC. Technology is crucially important to the economic future of the country and such initiatives to recruit good quality candidates into teacher training are to be welcomed".

A one-day conference was organised in 1991 by the EngC, the Association of Advisers in Craft Design and Technology and The Staff College, to provide an awareness of the possibilities offered by A and AS level technology courses. The EngC commissioned research into key issues facing technology in the National Curriculum; the results were published in May 1992 in a report (partly sponsored by BP) concluding that the National Curriculum technology was "a mess". An eight-point rescue plan was put forward. John Patten, Secretary of State for Education, speedily announced an urgent review (which was completed in December 1992) of the Technology Order but in August the EngC produced 'The revision of National Curriculum technology', followed in September by 'Technology at

A-Level – getting it right'; in this document the EngC pointed out that there were no obvious stepping stones between Technology in the National Curriculum and Technology in Higher Education, but offered eight recommendations to improve this situation. By the time the EngC Annual Report appeared in April 1993 there had been no Government response. Looking further at A levels, an EngC report of July 1993, 'General Studies: Breadth at A-Level?' concluded that 16-19 year olds were not offered the necessary breadth by General Studies. The EngC proposed five options for improvement, the most favoured being five subjects at A Level [similar to the previous 'Higginson proposals'] to give students a broader knowledge base - even in the knowledge that this might require honours degree courses to be extended to four years.

We may note here that throughout most of this period (1991-95) the Eastern Region Teacher Education Consortium, whose links with the EngC we described in the previous chapter, continued with its five-year project. However, some consortium partners changed - the Government's Training Agency was fully absorbed into its Employment Department, for instance, and the Essex Higher Education Institute became part of Essex University. Notwithstanding, the Consortium established links with the Department's 'Economic Awareness in Teacher Education' initiative, playing a central role in the Teacher Education component of the Royal Society of Art's project 'Higher Education for Capability'. The Employment Department provided additional funding to expand this project through the Universities of Cambridge and East Anglia and the Bedford College of Higher Education.

Sir Ron Dearing's final report on the National Curriculum, recommending that technology remained compulsory for 14-16 year olds, albeit for a half subject, was welcomed in 1994 by the EngC. However, the EngC yet again noted the serious deficiencies in technology as a subject in the National Curriculum. In general, the EngC considered it vital for the Government to ensure that there was extensive in-service training of teachers and adequate materials and equipment in the schools. In support of this in July 1994 the EngC published 'Technology Teachers – Getting It Right' and in December 1994 published 'The impact of Double Science'.

In 1995 the EngC's General Education Committee responded to the Dearing 16-19 review and fostered a number of related research projects: 'The Mathematical Background of Undergraduate Engineers' and 'Competence-based Higher Education and Standards Methodology' and also advised on the EngC projects for 5-19 year-olds. The EngC report 'The Changing Mathematical Background of Undergraduate Engineers' was published in March 1995, highlighting deficiencies that were widely reported in the media. The EngC, the Society of Education Officers and the SCSST set up a working group to investigate means to support schools to remedy this problem.

During SET7 (Science, Engineering and Technology Week) for 1994 the EngC and seven Institutions jointly organised a national painting competition for Primary School children. From 8,000 entries the winner chosen was 5 year-old Sam Bowditch from East Gomeldon, Wiltshire. He was presented with a £50 cheque by William Waldegrave, Minister for Science, while his school received £1,000 and the EngC gained some publicity. In the following year, a children's colouring competition, a joint event between the EngC and the Institutions to challenge children to draw an engineer, attracted 10,000 entries. During SET-95 week the EngC commissioned a lecture team featuring TV personalities Kate Belling and Johnny Ball and sent the team to seven towns and cities where fourteen performances of 'Are we engineering a better future?' were presented to over 6,000 youngsters.

To demonstrate the EngC's caring culture, 'Putting Animals First – Animals and Technology' was published in November 1994 in collaboration with the RSPCA. This comprised a set of simple guidelines for schools, pointing out that technology projects should not put animals or their habitats at risk.

A GNVQ in Engineering was piloted and launched for use nationwide in 1995. The EngC and the Engineering Employers Federation assisted the Department of Education and Employment (DEE) to promote technology-based GNVQs. The EngC formally responded to GNVQs at higher levels and to the Government's Beaufort Review of the Top 100 NVQs/SVQs. As a result of the EngC cooperating with ETA, META, IMarE, IMechE and IEEIE, model NVQs suitable for EngTech level occupations were developed.

The Technology Enhancement Programme

To improve the quality of teaching technology, science and mathematics to 14-19 year old students, a Technology Enhancement Programme (TEP), administered by Dr John Williams an EngC Senior Executive, was established at the end of 1991. Accompanied by a parallel study of practical applications, TEP was formally launched as a pilot scheme in 1992 with substantial financial support from the Gatsby Charitable Foundation in a three-year work-related programme. This was instantly a success. An explanatory brochure 'Technology Enhancement Programme' was published in May 1992. A central team of engineers and teachers worked closely with schools and industrialists to develop a series of self-contained modules of industry-related projects, each focussing on a specific aspect of engineering technology, with supporting student texts and equipment. Industry provided support through the Neighbourhood Engineers' scheme and liaison was established with the Eastern Region Teacher Education Consortium project.

As a consequence, 'TEP: Technology Enhancement Programme, the new link between industry and education' was published in May 1993 and more than 60 schools became involved during the year, raising over £500,000 to match TEP funding. The Programme was launched nationally at the House of Commons in 1994, attracting 60 MPs and peers; by the end of that year over 400 schools and colleges were participating whilst other organisations and schemes, including the CBI and the Nuffield Technology Project, were drawn into the Programme.

A unit was established at Middlesex University under the direction of Professor John Cave and working closely with the EngC to design and produce kits for projects and models to sell on a non-profit basis to participating schools. Over the next seven years this unit was most successful. Linked with this effort, a network of Education Managers was set up to advise teachers of science, engineering, technology and mathematics on resources, including industrial sponsors, for teaching projects. The SCSST, the British Association for the Advancement of Science, and the Schools Curriculum Industry Partnership were approached to see if joint cooperation with the network was practicable. By Christmas 1994 'Technology Enhancement Programme, 14-16 Textbook Series, Omnibus Edition' was published at £45 and a 'Young Technologist's Handbook' at £12. The Gatsby Charitable Foundation agreed to continue its funding to 1997.

During 1995 many TEP publications were made available including: 'Structures', 'Manufacturing', 'Control' and 'Energy' for post-16 year olds; and the special publications 'A Mini DC Generator', 'Shadow Air Muscle', 'Bit by Bit Programmable Controller', and

'Smart Wire and its Applications'. A TEP Video, 'Taking Control', was also produced, as was a pilot multi-media CD-ROM on manufacturing for schools and colleges to support GNVQ Engineering and GNVQ Manufacturing at Level 2 and above. Following trials, a final version was planned for issue in 1996. The range of these publications was subsequently extended considerably and their development and distribution continued by Middlesex University.

A Gatsby Initiatives' Board, chaired by Dr John Sellars, Chief Executive of the City and Guilds of London Institute, was established in 1995 by the EngC and the Gatsby Charitable Foundation to manage related projects in a more coherent manner.

The number of participating schools rose rapidly and in 1995 Wellfield Comprehensive School became the 500th school to join the TEP. To draw attention to this, the EngC and Sir Malcolm Thornton, Chairman of the Commons Select Committee of Education, jointly hosted an event, again at the Houses of Parliament, to which MPs and Peers were invited with representatives from education, industry and the Institutions.

By the end of 1995 there were 620 schools and colleges in the TEP programme and over 20 text books had been produced, including in October 1995 a mini text book, the first for Primary Schools. The GCSE syllabus: 'Design and Technology: Engineering' was developed in conjunction with the Midland Examination Group for introduction in September 1996, as part of the MEG Design and Technology syllabuses.

WISE

The WISE Campaign further heightened its influence during this period by producing new and improved videos, texts and posters. The WISE Award for 1991 was won by Nicola Young for an invention to help frail elderly people. The use of additional travelling exhibition and teaching facilities in buses, now nicknamed "Wisemobiles", enabled WISE to reach areas of Great Britain not previously visited. In October, Georgina Wicks of North London became the 100,000th girl to visit a Wisemobile; she was presented with a certificate by Home Office Minister, Angela Rumbold to mark the occasion. The 6th Wisemobile was launched by Lady Platt in November 1991 at the Royal Festival Hall, London. WISE extended its activities into Wales in February 1992, following the election of Dr Jarmila Davis, Senior Lecturer in Civil Engineering at the Polytechnic of Wales, as Chairman of WISE in Wales and to Northern Ireland in October 1992 – the latter with the support of Lord Belstead, Minister of State for Education for Northern Ireland and of Jeremy Hanley, Parliamentary Under Secretary of State for Northern Ireland. Thanks predominantly to WISE, it was claimed, 15% of students entering engineering degree courses were women by the end of 1991.

'Awards, Courses, Visits: Women Into Science and Engineering' was published annually in February 1991, 1992 and 1993, and in March 1994. In February 1992 the WISE poster 'there's a place for you…' was produced, and 'The Other Half', a careers break video, was remade in 1991 and launched in May 1992. A WISE video and information pack was launched for schools in November 1993 to enable them to gain the maximum benefit from a Wisemobile visit. By this time over 200,000 girls had sampled the technology presented in the WISE vehicles. To help parents stimulate their daughters' interests in engineering 'Engineering Equals for Parents' was published in December 1993.

In 1994 the tenth anniversary of the founding of WISE and its outstanding successes were celebrated with conferences in Birmingham and Wales and an essay competition for girls in secondary schools. In 1995 Baroness Platt of Writtle accepted the EngC's invitation to be Patron of the WISE campaign. Lady Platt had been a co-founder of WISE in 1984 and from then a constant and active supporter. David Hunt, Science Minister, and Gillian Sheppard, Education Secretary, were given demonstrations of mechanisms and control systems by schoolgirls on a Wisemobile in 1995. During SET-95 week, already referred to above, a video for WISE in Wales was launched, as were two posters on WISE for secondary schools in Northern Ireland.

Neighbourhood Engineers

Between 1991 and 1995 the Neighbourhood Engineers' scheme enjoyed a dramatic expansion, quadrupling in resource and scope with support from the DTI. Compared with the 3,400 engineers in 800 schools in 1990, the figures rose to 6,000 in 1,600 secondary schools in 1991, and to 9,000 engineers in 2,100 schools in 1992 when Tim Maskell IEng was appointed as the EngC staff member to manage the scheme. Two significant publications appeared during 1992: 'Neighbourhood Engineers – Practical support for schools' in January, and a 'Neighbourhood Engineers' Source Book' in October. The EngC had commissioned an evaluation of the scheme by Professor David Bridges of the University of East Anglia in the previous year; this showed that attitudes of both teachers and pupils had been influenced. Several of the report's recommendations were implemented such that by 1993 some 11,000 engineers and technicians were involved in 2,500 schools. Industry Affiliates supplied secondees to manage the scheme under signed agreements with the Engineering Training Authority and the Civil Engineering Careers Service. The scheme was further strengthened from this year by incorporating the similar IEE UNCLE project, possibly - and commendably - the only occasion when an engineering Institution had voluntarily merged an effort of its own with one of the EngC. By the end of 1994 the scheme included more than 13,000 active Neighbourhood Engineers in all nineteen of the EngC's regions, the national manager coordinating the work of the seconded local regional managers. During 1995 nearly 1,000 new Neighbourhood Engineers were recruited through a mail-shot to young members of IMechE and IStructE and a similar appeal was planned through the IEE.

The *Times Education Supplement*, in association with the EngC, launched 'The TES School of the Year Award' to recognise teaching excellence through the involvement of Neighbourhood Engineers. The intention was to give cash prizes to schools that had developed activities through Neighbourhood Engineers, contributing to the curriculum in topics such as technology, science, mathematics and English.

During 1991 it was decided that the somewhat similar Opening Windows On Engineering (OWOE) scheme, which involved fully-trained young engineers informing school pupils about engineers in industry, should be administered by the EngC jointly with its Neighbourhood Engineers' scheme. Accordingly, many Neighbourhood Engineers began to deliver careers information directly into schools in 1993. The OWOE scheme was fully integrated into the Neighbourhood Engineers' programme during 1995.

The Neighbourhood Engineers' programme was consolidated in 1995 and its procedures reviewed by a quality and audit group; its management and activities were improved and all new Neighbourhood Engineers were to receive induction training and be offered an opportunity to take the City & Guilds 7323 Foundation Certificate in Teaching, Training and

Development (NVQ-level 3) and add this to their personal CPD. In ten regions, management of the Neighbourhood Engineers' programme was contracted out under arrangements with SATROs or Education Business Partnerships. All in all, the scheme at this time could fairly be rated as a huge success, reflecting great credit on its EngC progenitors and all the participating engineers and technicians.

Young Engineer for Britain

The YEB competition attracted record entries for each successive year during the period 1991-1995, no doubt as a result of extensive national TV coverage in most of these years. In 1991 a video was produced for Neighbourhood Engineers to use in schools to also promote the YEB Competition. The video 'Young Engineers for Britain 'How they made it'' had become available on a one month loan basis for the first time in December 1991. It was reissued in October 1993 under the same loan conditions. The YEB winner for 1991 was Adam Seedhouse (18) whose invention allowed electric drills to make holes at different angles.

The first girl champion, Caroline Gledhill (18) of Ringwood, Hampshire, emerged as the YEB for 1992 with her invention of a low-cost, high-quality measuring device for high-speed tape recorders. Sir Roderick MacLeod, Chairman and Chief Executive of Lloyd's Register of Shipping, presented the champion with the YEB trophy, a personal prize of £500 and £1,500 for the purchase of engineering equipment for educational use. In 1993 there were nearly 1,000 contestants and the number of schools entering doubled to 260. Lucy Porter from Bath, a female winner, again, was chosen as the YEB for her invention of a swing exerciser for children unable to use their legs. The Lord Mayor of London, Sir Francis McWilliams FEng, presented the trophy and cash prizes at the Plaisterers' Hall.

Nearly 1,000 youngsters (11-19) entered the regional finals in 1994. It was won by four 17-year-old students from Plymstock School, Plymouth for inventing a "Flexi-valve" flow-control system for a waste-water works. The competition was sponsored by Lloyd's Register and National Westminster Bank while the national finals were held in the City of London. The YEB competition for 1995 had a record 1200 entries and the national finals were held at the City of London's Guildhall. The winner was Stephen Mosley (18) of Eckington School, Derbyshire, for his invention of an aerodynamic bicycle wheel. The prizes were presented by Richard Page, Under Secretary of State for Small Business, Industry and Energy. The principal sponsors were Lloyd's Register and the General Electric Company. For the first time the annual YEB competition at regional and national levels was a joint venture between the EngC and the Standing Conference on Schools' Science and Technology (SCSST) Young Engineers' movement. The project was termed "Young Engineers for Britain" thereafter. Many other prizes, some substantial financially, were awarded to young people in a variety of categories sponsored by many British companies.

Interfacing with Further and Higher Education

For many individuals who were studying in the areas of further and higher education, there was some welcome practical news in the Government's 1991 budget. For some time the EngC, with the Engineering Employers' Federation (EEF), had been campaigning for tax relief for individuals on the amounts spent on their CPD. Although this had not succeeded the Government did announce in 1991 that those who paid for their own training leading to most NVQs could now claim tax relief on study and examination fees – though not on books or

equipment or on travel and subsistence. With a certain amount of tongue in cheek the EngC gave the impression that this had been its intention all along.

A pilot scheme began in 1991 offering a Personal Development Logbook to engineering students who satisfied the EngC's Stage 1 (Education) requirements for IEng who had registered, but had not yet joined an Engineering Institution.

'Attaining Competence in Engineering Design (ACED)' was published in April 1991 for students interested in this specialist area.

The EngC Examinations were re-publicised throughout the UK during 1991, resulting in several thousand requests for details. An overseas publicity campaign was planned. Three new preparation courses at colleges began in the UK, including a first in Northern Ireland. Entries for the 1992 examinations increased by 7% for both UK and overseas candidates bringing the total to 3,857. A further three colleges submitted candidates for the first time, a feat that was repeated again in 1993. The aim and scope for the compulsory subject 'Engineer in Society' was revised in 1992 for the 1993 examination and new syllabuses were developed during 1992 and 1993 in electrical, control and information systems engineering in time for the 1995 examination. Further topics were considered and approved by the BER during 1995 for incorporation into the information systems' papers.

The EngC prepared a report in 1995 on 'Competence-based Higher Education and the Standards methodology', based on research by the University of East Anglia and funded by the Employment Department. The report provided an overview of initial teacher training, vocational training of general medical practitioners, engineering education and environmental science.

Top Flight Bursaries

For students in the first year of an accredited engineering degree course 'Top Flight – Bursaries for Engineering Students' was published in October 1993 as a prelude to the Top Flight Bursary Scheme. This scheme, devised to attract highly-talented people to a career in engineering, managed by the EngC and funded by the DEE was formally launched in 1994. Students on, or about to embark upon, full-time, sandwich and part-time courses that satisfied all the educational requirements for registration as Chartered Engineers were eligible. There were 2,108 approved applications in 1994 and 2,220 in 1995. Some students withdrew, leaving 4,209 who received the £500 bursary for each year of their courses, in addition to their maintenance grants. The associated brochure was republished in August 1994, August 1995 and July 1996.

Towards an up-dating of SARTOR

Responding to changes in the schools' National Curriculum and other significant education provision developments, three working groups under the executive direction of Professor Keith Foster, Director Engineering Profession, were established by the EngC in 1991 to look at (a) Needs, Demand and Supply, (b) Structure, Methods and Means, and (c) Standards of Attainment. The aim was to conduct a Review of Engineers' Formation to create a system of Engineering Education and Training that was more attractive, effective and appropriate to young people and their employers. A small steering group, chaired by Sir John Fairclough,

was set up in 1992 to oversee the work of the three working groups as he was similarly keen to promote this work as he was to see the Unification of the Profession..

The outcome in August 1993 was a discussion document entitled 'Review of Engineering Formation' [this should surely have been "Engineers' Formation"] from the Directorate for the Engineering Profession. The document was circulated nationally to industrial, educational, professional and other bodies, identifying changes to which the EngC could respond, and indicating options available to promote change. The document examined and invited comment on the structure and needs of industry, pathways to professional engineering practice, international comparisons, the possible convergence of SARTOR and NVQs, resources for engineering education and Quality Assessment. Many thoughtful and detailed contributions were received during 1993 and early 1994; these were independently analysed by Tony Cox, a former HMI engineer, whose results were published in May 1994.

As a consequence, in January 1995 the EngC published 'Competence and Commitment' containing proposals for new standards of education and training to meet the needs of British industry tied to business objectives. Developed from the policy of the original SARTOR of 1985, engineers and technicians who wished to join the EngC Register now had to demonstrate *competence* to perform their professional work to the necessary standards, and *commitment* to maintain that competence, to work within the professional codes, and to participate actively in the profession. However, the 1995 'Competence and Commitment' document proposed changes to the requirements in a number of important respects. The academic base requirements were raised so that, for example, a 4-year MEng course or equivalent would be needed for those intending to become Chartered Engineers. Also NVQs were given much more prominence as equivalent qualifications. But by far the most contentious proposal was to introduce minimum academic requirements for entry to accredited courses – in the case of honours degree courses, to three 'A' Level subjects all at grade C.

Although these proposals were the result of considerable input following the 'Review of Engineering Formation' they created differences with the Institutions and others, not least because the document could have been clearer and more succinct. In addition some felt that undue prominence had been given to the NVQ system which was relatively undeveloped and not yet seen by many as a viable alternative to older accepted routes. Nevertheless, in June 1995 'Competence and Commitment, Summary' was published and the Standing Committee for the Engineering Profession agreed an outline for a revised SARTOR, and approved the appointment of a facilitator/writer. A draft outline was made available in December 1995. It was planned that a SARTOR Institution Working Group should develop this and offer it to the BER. However, this work was destined to be prolonged into 1997, as we shall explain in Chapter 6.

Continuing Professional Development

The period 1991 to 1995 saw intensive development of CPD under the guidance of the EngC Executive, Chris Senior. Responsibilities of companies and individuals for CPD were outlined in the EngC policy statement 'National System, Continuing Professional Development, Framework for Action' published in March 1991. Most notably, a national system for CPD was launched during a major conference 'The Engineering Business', organised on 19 March by the Careers Research and Advisory Centre in association with the EngC and with support from British Petroleum. The EngC recommended that engineers and

technicians undertook a minimum of 35 hours a year of CPD. At this conference Tim Eggar, Minister of State at the DES, announced funding support for CPD, although the report on the conference published in June 1991 referred to 'Continuing Education and Training'! The terminology, CPD had not yet gained familiarity, even within the EngC, as was seen in the same month when 'The Engineering Council – Report of a Pilot Study – Continuing Education and Training (PICKUP)' was published. Be that as it may, a network of advisers was set up during the year to provide a framework for CPD in the regions. In December, 'Continuing Professional Development – The Practical Guide to Good Practice' was published and pilot workshops were developed to assist individuals and their employers to implement CPD. A CPD Forum [a partnership between the EngC and the Institutions] was established to share experiences and examine common issues. This Forum flourished, and was well supported by Institutions' staff, for many years.

Positive debate and progress on CPD continued throughout 1992. In March, at the Annual CPD conference at the Institution of Civil Engineers, the theme was 'Engineering: Making CPD Work For You'. Nine full-time or part-time Regional CPD managers were appointed during the year to promote and develop CPD activities locally and the CPD Forum began to publish *CPD Link* as a regular newsletter. By the end of 1993, CPD was no longer regarded as a novelty but essential for all registered engineers. A complementary approach was developed in collaboration with Investors in People and TECs/LECs. The CPD Forum continued to meet and in 1994 alone produced three issues of *CPD Link*. Further staff were appointed for Wales, Sussex and Kent to assist the regional CPD managers. The Department of Employment supported the EngC in organising 'Integrating CPD into Business', a conference held in partnership with the Careers Research and Advisory Centre and other professional bodies.

CPD initiatives continued to be advanced during 1995, with numerous presentations, distribution of the *CPD Link* newsletter and a nation-wide network of regional professional development advisers meeting regularly with employers. At the same time, in Northern Ireland, the Training and Employment Agency confirmed financial support for CPD throughout the Province.

Interfacing with Industry

Industry Affiliates

The EngC's activities with its Industry Affiliates were affected, in common with other on-going work, by the unification debate during this period. However, some 230 Industry Affiliates [identified in the 1991 Annual Report] continued a high level of support of money, staff and facilities, especially contributing to the debates on Risk and the Environment [see below] and by offering staff on secondment to act as Project Managers. The EngC appointed Bob Simmons as Industry Affiliates Executive in June 1991 to manage and coordinate Affiliates' activities. Bob Simmons had previously been a co-founder and Director of Columbia Automation Ltd, a company that specialized in the automatic testing of PC motherboards. Following that company's merger with Zehmtel Inc, Bob Simmons continued in the industry until joining the EngC. He later became the EngC Operations Manager, Industry and Regions. At the 1991 Industry Forum, Sir John Fairclough championed the unification proposals, having issued prior briefing notes - but as late as the 1994 Industry Forum, held at the IMechE in May, the central topic yet again was unification, causing a robust exchange of views.

The Industry Affiliate scheme was kept alive during 1994 by visits from EngC staff and the regular newsletter *Industry Link*. Sadly several companies left the scheme because of the financial recession, but new companies joined, enabling the EngC to continue to support the Manufacturing Industry Achievement Awards during 1995. A working party was set up, chaired by Council Member Michael Manzoni, former Deputy Chairman of R M Douglas Construction Ltd, to examine ways of strengthening links with the Industry Affiliates.

In spite of difficulties, extremely useful work was undertaken in this period with the Industry Affiliates, resulting in some helpful publications, including 'Monitoring and evaluation of manufacturing systems engineering initiative' which was published in March 1993. In the following July, to encourage the promotion of small and medium sized industrial enterprises (SMEs), the EngC published 'Identifying and Satisfying the Skills required of SMEs'.

EngC Staff

Perry Goodman, Director Industry and Regions, retired on 30 September 1992. His replacement, Bob Eade, had been Managing Director and Technical Director of Avo Ltd, and had spent some ten years with GEC in senior engineering posts, culminating as Chief Engineer, Telemetry Systems; Bob was also past President of GAMBICA, the trade association for the instrument, control and automation industries. In 1996, as a consequence of the Fairclough Initiative, Bob Eade effected the transition from Director Industry and Regions to Director Engineering Profession, leading the EngC directorate that served the BEP, as we explained earlier in this chapter.

Risk Issues, Environmental Issues

Discussion was embarked upon during this period on two major issues affecting engineers: risk and the environment. Two working parties had been established in 1990 [see Chapter 4], both of which culminated in a Code of Professional Practice. In 1991, the Engineers and Risk Issues Working Party prepared a draft Code of Good Practice; this was edited by a secondee from an Industry Affiliate, published in June and presented to the Engineering Assembly in July 1991. On being circulated to the Engineering Institutions and Industry Affiliates for comment, 92% of the responses were favourable. The final report presented to Council in 1992 by Sir William Francis, Chairman of the Black Country Development Corporation, was published in September as 'Engineers and Risk Issues, Code of Professional Practice'. It was formally launched in October 1992 as 'Guidelines on Risk Issues' at the International Risk Assessment Conference at the Queen Elizabeth II Conference Centre as part of the European Year of Safety, Health and Hygiene. The published Code was free to Registrants, £5 to Industry Affiliates and £10 to others. The Code, which came into effect on 1 March 1993, identified ten areas in which engineers and technicians should exercise influence to ensure that they acted with professional responsibility. This was the first Guide of Professional Conduct to be issued by the EngC, assisted with financial, moral and technical support on this occasion by Lloyd's Register of Shipping and the Health and Safety Executive.

Sir William Francis is on the record with his view:

"The [Engineers and Risk Issues] Working Party was a great success and completed the first ever Code of Professional Practice for the Engineering Council. The Professional Code of Practice on Risks Issues was an important move towards self-regulation since the document

had "teeth". It was linked to the Engineering Council's Bye-laws, Codes and Rules of Conduct and a Registrant could be de-registered if flagrantly disregarding the Code.

"The Code allowed for the engineering Institutions to have additional requirements to suit their particular disciplines. However, the Engineering Council did not pursue an implementation policy and few engineers were properly aware of the Code or the obligations."

And this on the same topic from Council member Ken Burrage is a fairly typical letter in response to the question inviting contributions to this *Chronicle* "How were you recruited to serve on the Council?"

"I volunteered! I became aware of the work the Engineering Council proposed to do in producing the Code of Practice on managing risk. In 1988 I was serving as deputy Director of Signal Engineering for British Rail (BR). Following the tragic railway accident at Clapham on 12 December 1988 I became BR Director of Signalling and Telecommunications Engineering with responsibility for implementing the recommendations of Sir Anthony Hidden's enquiry into that accident. In 1992 I wrote to Denis Filer and said that in view of the traumatic period that the railway had just been through post Clapham I felt that there was a contribution I could make in helping to produce the Code on Risk. The rest is history. I was invited to become a member of Senate and served on a number of committees and working groups until finishing my contribution to the Engineering Council as one of the 16 transition members between the old "Council" and the new arrangements brought in as part of the Unification arrangements. I worked closely with Bill Francis on the Risk Code and particularly closely with John Fairclough on the Unification project."

The Engineering and the Environment Working Party chaired by Professor Roland Clift, the second Working Party that had been formed in 1990, also prepared an initial Code of Practice in 1991; this code was to encourage a greater awareness, understanding and effective management of environmental issues among Registrants. Then, under the chairmanship of Council member Professor Michael Burdekin of UMIST, the code was presented to the Engineering Assembly in July 1992 and published in October 1993 (to become effective on 1 March 1994) as a 'Code of Professional Practice on Engineers and the Environment'. It was jointly sponsored by Lloyd's Register and the Department of the Environment. Much of the work on this was undertaken by Simon Morgan, the EngC's recently appointed Senior Executive, Industry. A companion 'Guidelines on Environmental Issues' was published by the EngC in September and distributed to all Industry Affiliates. Similarly to the Risk Issues Guidelines, this was made available free to Registrants, £5 to Industry Affiliates and £10 to others. In the following four months there were 10,000 requests for copies.

Engineering Occupational Standards

A contract was drawn up in 1991 with the Department of Employment for the EngC to host the emerging Engineering Occupational Standards Group (EOSG). The aim was to coordinate the development of occupational standards, in a range of fields and levels of engineering, to provide a sound basis for the development of NVQs recognised by the Engineering Institutions and compatible with the needs of industry. Under the EOSG in 1992, and supported by the professional Institutions, three Industry Standing Conferences [in addition to the Construction Industry Standing Conference already in place] were established covering Extraction and Process, Engineering Manufacturing and Engineering Services (Operations).

The EOSG was on track during 1993 to deliver a library of occupational standards for engineering from which NVQs at levels 3, 4, 5 could be assembled, thereby creating greater compatibility between NVQs and standards of professional competence. It was encouraging to see how the debate moved from questioning the need for NVQs to considering how they could be implemented most effectively. By 1994, the three Industry Standing Conferences just mentioned had become recognised as the lead bodies for professional, managerial and technical qualifications within the engineering industry. Sir Anthony Gill, a long-standing member of the EngC Council, took over as Chairman of the EOSG during the year. His specific task was to oversee the transition from the temporary body that had been created to set standards for development, to a long-term arrangement in which occupational standards were the accepted resource for the engineering industry and related professions. Indeed, in the following year, a possible Occupational Standards Council for the engineering sectors was debated.

Interfacing Internationally

The EngC's Registration Department under Alan Wilmshurst took over the management of the British section of the FEANI Register from the British National Committee on 1 May 1991 and in June published 'Engineers and Europe'. EngC Council Member Sir John Cullen [he was also Chairman of the Health and Safety Commission] took over as Chairman of the British National Committee from Dr Alastair Paterson in November 1991 while Professor Keith Foster took over as Secretary-General from Professor Jack Levy. As provided in the Washington Accord, visits to observe accreditation in other countries took place and the UK received observers from Australia, Canada, Ireland and USA.

In May 1995, the EurEta [the IEng body within FEANI] held its General Assembly in Venice. In the following month the biennial meeting of the Washington Accord was held in Dublin, all six countries, Australia, Canada, Ireland, New Zealand, UK and USA having now ratified the Accord. At this time the Hong Kong Institution of Engineers was admitted to the Accord.

At the FEANI General Council Meeting held in September 1995 in Budapest, Sir John Cullen, still Chairman of the BNC, was elected Vice-President of FEANI. A European Affairs Committee met for the first time – its UK representative was Sir Anthony Gill.

During 1991, the 40th Anniversary of FEANI, the number of British Chartered Engineers registered as Eur Ing rose from under 6,000 to over 8,000 and the number of Group 2 Registrants (IEng) rose to 425. When one realises that the total number of Eur Ings at this time was just over 11,500 it is evident that Britain was well ahead of the other FEANI countries. During FEANI's 40th birthday celebrations in Luxembourg, its 10,000th Registrant as Eur Ing, British engineer Mrs Sheila Henderson of Southampton, was presented with her certificate by FEANI President, Lambetus de Steur of The Netherlands. By the end of 1993, five years after the European FEANI register had been established, there were 10,300 British Eur Ings. Over the previous few years the number of applications for Eur Ing had decreased, causing financial problems. Consequently application fees forwarded to FEANI [in Paris] were increased, subscriptions from member countries were raised by 20% and the overheads in Paris were reduced to provide a surplus for the first time for some years.

Several publications relating to international activities were produced in this period. These included in June 1992 'Graduate Manpower Output', containing international comparisons

from 1983 to 1988, and a 'European Engineering Yearbook' in July 1994 containing details on professional engineering associations in Europe, which sold at £10.95, followed by the 'European Engineering Yearbook 1996' published in May 1995 by FEANI with considerable encouragement from the EngC.

Interfacing with the Public

Environmental Issues

Throughout the period from 1991 to 1995 the EngC had become more concerned with the environment and, as we mentioned above, had set up an Environmental Working Group to prepare a Code of Conduct and accompanying Guidelines. With many of the unification issues of the Fairclough Initiative now settled, the EngC took part in an environmental exhibition at Birmingham for the first time in 1994. This provided an opportunity to publicise the EngC and its concern for the environment. The Environment Award for Engineers for 1994, sponsored by Lloyd's Register, was won by Jon Lindley who was awarded the trophy plus £3,000.

At EnviroTech95, held at the NEC Birmingham in May 1995, the EngC had a display that was used to promote the Environment Award for Engineers, the Council's Guidelines on Environmental Issues and the profession in general. The 1995 Environment Award for Engineers, sponsored by Lloyd's Register, BT and British Aerospace, was won by Steve Maxwell and Ian Barnard. The Lloyd's Register Trophy and £5,000 were presented by environmentalist Jonathan Porritt.

The Public Affairs team during this period was heavily involved in promoting and publicising many of the issues that we have mentioned in this chapter through newspapers, magazines and other news media. Fact Sheets, summarising various activities of the EngC, were made available in early 1992; topics covered included The Register, WISE, Neighbourhood Engineers, the Eastern Region Teacher Education Consortium, and the Role of the EngC. The intention was to up-date these Fact Sheets quarterly. Other dedicated publications including 'Response to the Consultation by the Office of Science and Technology to the Proposed White Paper on Science and Technology' in December 1992, and 'A Vision of Technological Research for visually disabled people' in March 1993. Twelve months later the colourful and well-received guide, 'Engineering for People' was published for school pupils; and then in November 1995 a brochure, 'Engineering for Life' was published to celebrate the achievements of engineers, as a back-up to the BBC-2 TV series, sponsored by the EngC, the DTI, the IEE and Nuclear Electric plc. A total of 43,500 copies of the brochure were distributed, 8,500 in response to viewers' requests. *The Times* and the *Daily Telegraph* published names of new Registrants on four occasions during 1995.

In November 1991, *Newsletter Extra* was distributed with details for Registrants on EngC operations and finances; this was in addition to the regular six-monthly *Newsletter* that was sent to every Registrant each Spring and Autumn. The annual corporate leaflet 'Shaping Britain's Future' was published in August 1991, December 1992, September 1993 and November 1994 while the EngC's annual reports continued to be released each May for the preceding year.

As another consequence of the Fairclough Initiative, *Engineering First*, a new newspaper for Registrants, together with a new corporate identity and logo, was prepared in 1995 ready for launch in January 1996.

People

Denis Filer's Contribution to the EngC

From his arrival in 1988 to mid 1995, Denis Filer had built upon existing activities and added others, particularly acting as a bridge between the EngC and the Institutions during the complex negotiations surrounding the Fairclough Initiative. He considerately postponed his retirement to provide continuity while the arrangements for the "new" EngC were being put into place. According to his successor, Mike Heath, this involved "changing the aircraft's engine while it was still in flight" but as he stated in the 1995 Annual Report, "that is something that engineers are uniquely equipped to do". Equally importantly, as we have shown in this chapter, Denis Filer had encouraged the advancement of many other EngC activities whilst the higher-profile Fairclough Initiative was dominating this period. He also initiated the exploratory work in late 1994 for the EngC to become recognized as an "Investor in People" - which was finally achieved in 1998 as we shall see in the next chapter.

Denis Filer had a strong track record in his involvement with the profession. When he became Director General of the EngC he was a Vice President of the IMechE. In the New Year List for 1992 he was honoured by being awarded a CBE. After completing his tenure as Director General he later became President of the IMechE. He wrote:

"When I arrived at the Engineering Council as Director General, I inherited a situation where there was constant friction between the "Big 4" Institutions and the Engineering Council. I believe this was in part caused by the imposition in 1983 of the newly created Engineering Council, following the Finniston Committee, onto the Institutions. They didn't want an Engineering Council and would have preferred to stick with the old, ineffective CEI. [Authors' note: As we pointed out in Chapters 1 and 2, there were at least three different opinions on this point.]

"However, one of the principal reasons for the antagonism was the perceived lack of control by the Institutions of the Engineering Council and indeed criticism of the rather undemocratic election process for members of "Council" of the Engineering Council - Council voted for new members of Council and there was no way that Institutions could get their nominees onto the Council.

"In an attempt to improve this situation the Chairman at that time, John Fairclough, embarked on his "Unification Initiative" which is well documented. With considerable help from Alan Rudge [then President of the IEE], John Fairclough persuaded 39 Institutions to sign up to his initiative and give their support to the reformed Engineering Council.

"The most dramatic part of the reorganisation was the changed election system, under which 24 members of the Engineering Council Senate were elected by Institutions, 24 by Registrants and 6 by the Privy Council. In practice, many of the 24 elected by Registrants were nominated on the initiative of the Institutions!

"The result of this reorganisation was that all senior elected positions on the Engineering Council were filled by ex-Presidents of Institutions (e.g. Alan Rudge, Robin Wilson, Tony Ridley, Brian Kent etc) with other Presidents and ex-Presidents as members of the Senate. One would have supposed that this situation would have given the Institutions considerable influence over the Engineering Council affairs, and would have given them some sense of ownership. Unfortunately this was not so, and I heard complaints (from Institution Directors General / Secretaries) that ex-Presidents appeared to "change their spots" when they joined the Engineering Council! Thus the criticism and ill feelings continued - *ad nauseam*.

"There was a feeling amongst some Institutions that the Engineering Council should have done the basic minimum of registering of engineers, and auditing the performance of Institutions. The word "subsidiarity" was mentioned frequently. However subsidiarity could be interpreted in two ways:-

i) If a task can be carried out by Institutions then it should be.
ii) If a task can be carried out better by Institutions then it should be.

"I must confess that I favoured the latter."

In May 1995, Denis Filer retired as the EngC's Director General and was replaced by the third Director General Mike Heath CB, CBE, CEng, a Major General from REME. Mike Heath was recruited into the Engineering Council by interview after an initial approach by a member of the Council. The interview board was chaired by Sir John Fairclough and included Sir Frank Holroyd, Sir Geoffrey Allen, Malcolm Hutchinson and Brian Kent. To quote Mike Heath's own words: "I took up the post of Director General at a critical time when Sir John Fairclough had concluded an epic series of negotiations with the Institutions, resulting in a Declaration of Intent that sought to unify the Profession behind the leadership of the Engineering Council. His role in this was nothing less than heroic, even though he had not had his own way in what was finally agreed. Decisions having been made, however, it was my job to lead the change."

During 1995, as part of the new Director General's policy to demonstrate that the EngC had ceased its navel gazing, Mike Heath and Brian Kent, a Senator and Chairman Designate of the BEP, visited 10% of the Industry Affiliates, and the Affiliates' own newsletter, *Industry Link* was given a face-lift. The EngC's regional organisation and links with industry and its Affiliates were reconsidered during the year 1995. Mike Heath was anxious that the new EngC should not concentrate on internal matters and that better communication was needed within the profession, as well as externally. It was generally agreed that the environment, transport infrastructure, communications and energy were important issues for the nation and could be incorporated into the Government's '20:20 Vision' Programmes. In Chapter 6, we shall mention how the Joint Venture activities on these issues were led by four of the large Institutions, albeit with some dissent from the smaller Institutions that specialised in these topics that they had, yet again, been by-passed by the larger bodies.

To promote a higher profile for the EngC among MPs and Peers, Mike Heath met Sir Malcolm Thornton, Chairman of the Commons Select Committee of Education, and Mrs Anne Campbell, Chairman of the Parliamentary Scientific Committee. Also, members of the Commons' Scientific and Technology Select Committee visited the EngC to be briefed on unification issues.

Professor Foster's retirement

Unfortunately, before work on the new SARTOR was complete, Professor Foster retired in December 1995. During his tenure since 1990 he had improved education and training relationships with the Institutions, streamlined some committee structures and successfully introduced a quality assurance system for registration procedures within each Institution. After his retirement he joined EOSG [see above] and spent the following nine months as Development Director producing clear occupational standards for engineering. In harmony with these concepts, a package for implementing new standards on energy management was developed during 1995 in partnership with the Institute of Energy, the Department of the Environment and the Management Charter Initiative.

Professor Foster's successor at the EngC as Director Engineers' Regulation was Robert [but known as Robin] Bond, whom we shall mention in Chapter 6. However, within a year Robin Bond also retired from the EngC and so the transition to the new SARTOR was not completed and, indeed, ran into more difficulties of various kinds. However, this was not the end of the story, as we shall see in subsequent chapters.

Sir John's Contribution

The Chairman, Sir John Fairclough stepped down at the end of his term of office in December 1995 having, with great energy, seen through the most comprehensive changes in the remit and organisation of the EngC since its inception. Sir John himself had said in the 1994 EngC Annual Report, the year in which the Unification Consolidation Document had been published, that it had been "An important period for the Engineering Profession" – perhaps an understatement. Dr Alan Rudge, the incoming Chairman of Senate writing in the Annual Report for 1995, dubbed Sir John's final year as "a momentous year for the Engineering Council". But how successful in total was the Fairclough Initiative? A verdict on that must await impressions given in the next Chapter.

The President's Award

The President's Award for outstanding contribution to the engineering profession was presented in 1995 to Professor John Caldwell [Chairman of the BER and the Standing Committee for the Engineering Profession] and to Horace Beaven [ECRO, South West region] and, on a separate occasion, to Sir John Fairclough for his contribution to unifying the profession. The EngC Council also approved the presentation of the Award to Harold Etherington [Yorkshire and Humberside region] who had made a significant contribution to EngC regional developments.

Sir Kenneth Corfield
1981-1985

Sir Francis Tombs
1985-1988

Sir William Barlow
1988-1990

Sir John Fairclough
1991-1995

Dr Alan Rudge
1996-1998

Dr Robert Hawley
1999-2001

Fig. 8 Chairmen of the Engineering Council

Chapter 6 – 1996 to 1998 : The Rudge Years

Coping with Change

People and Structure

Dr Alan Rudge CBE, FEng, FRS, FIEE, was elected Chairman of the EngC in succession to Sir John Fairclough on 1 January 1996, a post he held for three years. In 1996, Dr Rudge was Deputy Chief Executive and Main Board Member of BT plc and Chairman of the Engineering & Physical Sciences Research Council. He was also a Member of the Cabinet Office Council for Science and Technology, of the Defence Research Agency Council and of the DTI Multimedia Industry Advisory Group, and he had been President of the Institution of Electrical Engineers from October 1993 to September 1994. During 1997, Dr Rudge relinquished his posts with BT plc but he became Chairman of W S Atkins plc and of ERA Technology Ltd., and he also joined the Boards of GEC plc, of Lucas Varity plc, and of GUS plc, and he became a member of the MoD Strategic Defence Review Panel.

The EngC's Director General Mike Heath had been in post for only six months and so there was a more or less simultaneous change of Chairman and Director General. It is noteworthy that this replicated the situation back in 1988 when Sir William Barlow and Denis Filer succeeded Sir Francis Tombs and Dr Kenneth Miller within a similar six-month period. One can speculate that such simultaneous changes hindered the development of the EngC by dislocating continuity of policy and adding to the length of the leaders' 'learning curves'. Curiously, this almost simultaneous change of Chairman and Director General was later to be repeated a third time when Malcolm Shirley became Director General in June 1998 and Dr Robert Hawley succeeded to the Chairmanship in the following January.

Betty Hatton, who had been PA to the Directors General from the beginning and who had made a huge contribution to the smooth running of the EngC at all levels, retired in 1998. Her service was appropriately recognized by the award of an MBE.

Senior Staff Changes

Also by chance, all four operational Directors changed within a few months in 1995/96. This was by no means due to any factor of performance of those who retired but was purely coincidental. The Secretary to the EngC Council, Lewis Chelton, was succeeded in November 1996 by Chris Hall TD, MA, FCA, who was given the title of Finance Director and Secretary. Chris Hall had been with the Department of Transport for five years, the last two with the Highways Agency where he had primary responsibility for valuation of the road network and the Agency's other assets, together with the development of its commercial accounting policies.

At the beginning of 1996, the Directorship of the new Board for Engineers' Regulation was taken by Robin Bond MA, FEng, MICE, FIMechE, FWeldI. Robin Bond came to the EngC from being an Engineering Director with BP, a Council Member of The Welding Institute and from 1989 had sat on a number of committees of the Fellowship of Engineering. At the time of his appointment as an EngC Director, Robin Bond was deeply involved in the Royal Academy of Engineering's Programme Committee and its Panasonic Trust, which offered funding for CPD at the Masters Degree level.

The Directorship of the Board for the Engineering Profession passed on 24 January from Bob Eade to Robert (Rob) Jones, formerly Chief Executive of the Defence Helicopter Support Authority in the rank of Brigadier.

Ron Kirby, the last of the original team of Directors retired in May 1996. For thirteen years he had initiated and fostered a comprehensive public relations programme putting the EngC firmly on the map whatever its detractors might have said. An experienced journalist, he had used his Fleet Street contacts to good advantage and had gained the respect and co-operation of his fellow Directors and Council members alike. His OBE for that work was more than well deserved. Ron Kirby was replaced by Brian O'Neill who joined the EngC from the Anglo-French industrial giant, GEC ALSTHOM where he was Head of Communications. Prior to that Brian O'Neill was a Public Relations practitioner with a number of public and private sector organisations including the Royal Society for the Prevention of Accidents, the United Kingdom Atomic Energy Authority and Tilbury Douglas.

It is apparent that a major problem for the EngC was the huge loss of corporate memory that it suffered as a result of the above key staff members leaving at about the same time. This was in contrast to the Institutions where staff members tended to maintain continuity even when Institution Officers, such as Presidents, changed more frequently.

Fig. 9 The Engineering Council Logo from 1996

This logo, designed by corporate identity consultants, Newell and Sorrell, highlights the importance of the individual engineer in the discipline of engineering by throwing a spotlight on engineer in engineering council.

The Launch of the New Engineering Council

So 1996 saw the launch of the new EngC following the Fairclough Initiative and events moved quickly in the first two months. The revised Royal Charter and Bye-laws granted by the Privy Council became effective and the new EngC's Supplemental Royal Charter was issued by the Privy Council. On 1 February the Inauguration Dinner of Senate was attended by The Duke of Kent. A new corporate identity with a new logo [see Fig.9] was introduced to promote the new arrangements. The formal launch of the new EngC took place on the following day through a series of simultaneous events entitled "Engineering in Action" in London, Glasgow, Belfast and Cardiff. Again The Duke of Kent demonstrated his personal support, this time at the London launch at the QEII Conference Centre, at which the keynote speaker was the Rt Hon Michael Heseltine, Deputy Prime Minister and President of the Board of Trade. Presentations followed on 'Engineering and Life' by David Bellamy the environmentalist, writer and broadcaster, 'Engineering and Education' by Professor Alec Broers the Vice Chancellor elect of the University of Cambridge, and 'Engineering and Money' by Sir Alastair Morton, Chairman of Eurotunnel.

In February, to herald in the new EngC, an A3-size glossy newspaper *Engineering First*, was issued in a completely new style and format compared with the original *Newsletter*. This continued to be published every February and August throughout this period and was mailed to every Registrant, to all Institutions associated with the EngC and to many other organisations and individuals.

Although extensive preparations had been made during 1995 for the reformed EngC, Senate had still to approve methods of working and the general direction of activities before these could be brought into effect. Most activity had been internal rather than external leading up to the launch but thereafter the EngC attempted to raise the profile of the profession with support from Government Ministers - notably Michael Heseltine. Senate met six times in 1996, first in January, to approve the composition of the BEP and the BER [see Chapter 5] and the terms of reference for a Finance and Audit Committee, for an Election Committee and for an Executive Board [to supervise the EngC's executive and to coordinate the BEP and the BER]. During the year Senate approved the EngC's first Corporate Plan which included a contemporarily fashionable mission statement, strategic aims and corporate objectives – the latter expanded into plan objectives and targets stretching into 1999.

As we described in the previous chapter, the new large Senate in 1966 comprised 54 members: 16 newly elected by councils of the Institutions and 16 newly elected by Registrants, joined by 6 Privy Council nominees, and 16 persons who were either members of the former Council or Institution members who had been heavily involved in negotiating/agreeing the new arrangements. At the end of this transitional year, the latter 16 Senators retired.

The total costs of the election process were borne by the EngC in 1996 and the launch of the new EngC caused a (planned) deficit of £120,000 for that year. Revenues were lost as a result of administering activities for the Gatsby Charitable Foundation and the Engineering Occupations Standards Group. To recompense for these losses a rise in registration fees was planned for 1997; in the event the fees were raised above the rate of inflation, using the promotion of SARTOR-3 [see below] for justification. So, although financial reserves were reduced in 1996 a modest surplus was achieved in 1997, so beginning to restore the finances.

Joint Venture Groups (JVGs)

The EngC's revised Royal Charter and Bye-Laws enabled Fairclough's "New Relationship" to be forged between the Institutions and the EngC. One aspect of this was the setting up in 1996 of short-term Joint Venture Groups, each led by an identified Institution, to consider particular national issues that were thought likely to challenge professional engineers. In keeping with the Government's Foresight programme that had been launched in 1994 to visualise and address the implications of a number of issues to the year 2020, the EngC's Joint Venture exercise attracted the title '20/20 Vision Programme'. The topics chosen were the environment (led by IChemE), energy (led by IMechE), communications (led by IEE) and transport (led by ICE). All Institutions were invited to participate but inter-Institutional rivalry soon reared its head once more, the Institute of Energy, for example, claiming that it should have led the energy group, although in reality the larger Institutions had broader financial bases to be able to support this activity.

The first Annual Conference of the reformed Engineering Council was held in September 1996 at Church House, Westminster. Delegates and representatives from industry were told of the proposals that 1997 was to be designated the Year of Engineering Success (YES). Preliminary reports were also presented by two of the 20/20 Vision Programme Joint Venture Study group leaders – Professor Tony Ridley (ICE) on transport, and Professor Ernest Shannon (IMechE) on energy. Reports on the Environment and Communications topic were not available until the 1997 Conference.

Interfacing with Government

Although the new Engineering Council was now establishing a good relationship with Government during 1996 and was beginning to be recognised as the "Voice of the Engineering Profession", there were complications. The unification activities, as already indicated, had seriously reduced the EngC's financial resources and a General Election was looming in the following Spring, diverting Ministers' attentions. Nevertheless, a vitally important agreement in the form of a Memorandum of Understanding (MOU) was developed during the year (and signed in March 1997) between the EngC and the Conservative Government. This profound agreement recognised the EngC as the UK body to represent the engineering profession [significantly, a re-statement of the supplemental Royal Charter], and also committed, but did not legally bind, the Government and the EngC to jointly maintain a national workforce of professionally qualified engineers. The MOU also pledged the Government to look to the EngC to "offer advice on national issues such as education, training, industrial competitiveness, risk, the environment… where engineering is a major factor." The Memorandum was made available on the EngC's website in the Autumn of 1997. The MOU was so all-embracing that we quote it in full in Annex G.

Coming hard on the heels of the results of the Fairclough Initiative, an unambiguous MOU of such range and depth (that was subsequently endorsed by the Labour Government after the 1997 election), presented a great opportunity. This should have put the EngC on course for an order-of-magnitude change in activity and regard. Unfortunately the MOU does not appear to have been exploited to even half of its full potential. In particular it could have opened the way to the EngC being the "principal representative of the engineering profession in dealings with the Government…" (Article 4(b) and (c)). There was, indeed, a certain amount of increased contact with Government - some Council Members met with the Prime Minister at the annual Labour Party Conference in 1998 when a number of issues were discussed and

EngC representatives also attended the Conservative and Liberal-Democrat annual conferences. It became EngC policy to provide a presence at the annual conferences of all major political parties.

However, with hindsight it seems clear that much more advantage could have been taken of the MOU, always assuming, in the light of the "New Relationship", co-operation from the Institutions – maybe a big assumption in view of their desires to enjoy their own close contact with Government Departments.

Committee Developments

Senate met five times during 1997 receiving reports from the BEP, the BER and the Executive Board. It approved the Memorandum of Understanding [Annex G] to which we have just referred. The end of 1997 saw the retirement of 16 transition Senators, who had been elected in 1995 to serve during the first two years of the new EngC. A further 15 transitional members, who had been elected in 1995 for 3 years, retired in 1998. Two Senators, Sir Peter Williams and Sir Michael Lickiss, nominated by the Privy Council retired from Council; the former was replaced by Dr Robert Hawley whom, in December 1998, Senate identified as Chairman from 1 January 1999 [see next chapter].

The Post-Fairclough EngC's second Annual Conference was held at the Institution of Civil Engineers in November 1997. The opportunity was taken to introduce the EngC's new award of a gold medal for "any individual, group or organization who, in the opinion of the Engineering Council, has made an outstanding contribution towards increasing the national standing of engineers and the engineering profession". Known as "The Chairman's Medal", the first to be awarded were presented on 19 November 1997 by HRH The Duke of Kent to members of the team responsible for the Thrust supersonic car that had broken the land speed record. At the Conference the study groups from the 20/20 Vision joint programme also reported: Dr Malcolm Kennedy (Vice President of IEE) spoke on Communications, Dr Tony Barrell and Dr Mark Smith (IChemE) on Environment97 – an innovative cyber conference presentation. Follow up reports on energy and transport also were presented, by Mrs Pamela Liversidge (IMechE) on the former and again, as in 1996, by Tony Ridley (ICE) on the latter. The findings were distributed to key audiences including the Government.

To provide a framework to engender a team spirit and cohesion for the EngC staff who were attempting to cope with major internal organisational upheavals, Mike Heath, very soon after his appointment in 1995, built on his predecessor's idea of the EngC aiming for the 'Investors in People' award. As Diane Davy, Secretary of the Institute of Energy, wrote in an article in the *Daily Telegraph* on 16 July 1998: "One way to acknowledge [the value of staff] is by public recognition, such as comes from being an Investors in People organisation." To achieve this award its assessors have to be sure that the applicant organisation has "a business plan, clear job definitions for the workforce, organisation-wide training and development plans and simple systems to support the cycle". But in 1995 the EngC had no corporate plan or mission statement, so Terry Smith, who had been taken on to the staff previously to look after QA issues, was asked to pursue the issue. He interviewed a cross section of EngC officers and staff and after considerable behind-the-scenes work by many members of staff, encouraged by Mike Heath and his advisors, the EngC became recognised as an Investor in People in the summer of 1998. Diane Davy's article was in celebration of the EngC achieving this accolade. She quoted Mike Heath's boast: "The place seems so much more active. Everyone at every level feels as if they are contributing to moving the Engineering Council

forward". And for a while this may have been the case, but further upheaval was around the corner, as we shall see.

At the third Annual Conference of the EngC, held in April 1998 at the Institute of Marine Engineers' offices, The Duke of Kent presented Professor Sweeting of the University of Surrey with the Chairman's medal for his work on satellites. Margaret Beckett, President of the Board of Trade, spoke on the important contribution engineers make in improving the competitiveness of the UK and its economy. She also confirmed the Government's support for Quinco, the campaign to promote engineering [see below]. Shadow Chancellor Francis Maude spoke on a single European Currency.

Stemming from the Fairclough Initiative, the Partnership Document 'A Lasting New Relationship – A Proposal for a UK Engineering Confederation' that the 39 Engineering Institutions had agreed with the EngC, and to which the Presidents of all these Institutions had added their signatures towards the end of 1995, was intended to last for three years from 1 January 1996 with a further review planned at the end of this period. Hence, to look further ahead from 1999, the Board for the Engineering Profession (BEP), with the approval of Senate in July 1997, set up a Strategy Working Group (SWG) to consider ways forward. The aim of the SWG was "To create, in Partnership with the engineering Institutions, a Strategy to Guide the Engineering Council's role and operations up to the year 2005 in the context of a shared vision for engineering in the longer-term future". The scope of the SWG, agreed by Senators, was "To act on behalf of the Senate of the Engineering Council. It was to consult widely within the engineering community in the UK, taking views from: the engineering Institutions, industry, the Registrants, relevant Trades Unions, the Government, Academe and other interested bodies". The SWG began meeting in August with Senator Tony Ridley as Chairman [he was also the BEP Chairman]. Its membership of 15 included two Institution Secretaries, Senators from the BEP and the BER, and four EngC staff members. A preliminary draft Strategy was presented to Senate at its meeting in May 1998. It is not clear how far this move took into account the MOU with Government.

However, at its September 1998 meeting, Senate approved the conducting of another significant review of the EngC's various and diverse activities. It was believed that after three reasonably successful years, further improvements in the relationships with the Institutions were desirable and some tuning of the EngC's activities was now apt. Some Senators felt that the EngC was spreading itself too thinly and, instead of concentrating on its core objectives, was possibly expending resources on peripheral activities. Consequently, the Strategy Working Group that was looking ahead to 2005, was put on temporary hold [it resumed its work in January 1999] and rather confusingly, a separate Activity Review Group was set up, chaired by Dr Alan Rudge, also Chairman of Senate. This Activity Review Group comprised Roger Dobson, Director General and Secretary of the Institution of Civil Engineers, Robert Foster, Senator and DTI Staff Member, Malcolm Shirley the EngC's Director General, Peter Wason, Secretary of the IIE and Dr John Williams, Secretary of the IEE. The recommendations of the Activity Review Group were embodied in the Activity Review report, entitled 'The Way Forward' which was presented to Senate at Dr Rudge's final meeting in February 1999, as we shall see in Chapter 7.

The SWG had concluded in early 1998 that a new strategy was needed for marketing the Register nationally. Its recommendations were incorporated into the Activity Review Group's document 'Engineering 2005', a draft of which was sent to Institution Presidents and Secretaries, Senators and others for comment. Its 11 recommendations – particularly a more

active marketing of IEng and the use of "Engineer" as a prefix, supported by the Institutions and Registrants - was approved by BER and then by Senate at its May meeting. Afterwards it was sent to Institutions and others for further comment before publication. 'Engineering 2005' was intended to be implemented in 1999 by the EngC in partnership with EEF, EMTA and ECITB. The Government offered its full support, and the communications agency J Walter Thompson provided considerable guidance, however, in the event, as we shall see in Chapter 7, this Strategy was put in temporary hold by Senate in February 1999, sadly never to be seen again in that form.

After some deliberation, St Peter's Church, Eaton Square, London was chosen as "the Engineers' Church" for all associated with the profession as a whole, and a carol service was held there in December 1998 and annually thereafter. Also during 1998 the EngC web-site was expanded and given a new look that further added to its modern image. Notable visitors to the EngC offices during this period included, in 1997, John Monks, TUC General Secretary and, in 1998,The Duke of Kent to meet with the staff.

Interfacing with the Institutions.

Institution Working Groups (IWG)

In keeping with the Fairclough Unification vision of closer cooperation between the Engineering Institutions and the EngC, the idea of setting up a number of Institution Working Groups (IWGs), in parallel with the Joint Venture Groups – see above, was agreed in 1996 to ensure that when an important issue or project was contemplated the profession as a whole could be involved, with the EngC acting as facilitator. The IT Liaison IWG, for instance, met throughout 1996 when a search system was established to improve access to internet websites of the Group members. Other IWGs examined the regional arrangements, the EngC's and Institutions' links with industry, the nomination and licensing process, the licensing of engineers, a revision of SARTOR, and the Young Engineers project. Although resource-intensive, this was felt to be a step forward in improving the relationship between the EngC and the Institutions. The IWGs could be construed as fulfilling the role of the "Colleges part" of the Fairclough plans, but they were transient rather than permanent groupings.

A Professional Young Engineers' (PYE) scheme was created out of another Working Group reporting to the BEP. Twenty of the Institutions were represented on PYE, several of whose members attended a reception at the House of Commons and met MPs in June 1998. Full of enthusiasm, PYE turned its attention to international matters, as we shall describe under that heading later in this chapter.

A further initiative to improve relationships was taken at the beginning of 1998 under the chairmanship of Andrew Ramsay, the EngC's newly appointed Director – Engineers' Regulation. The 'Communications With Institutions Task Group' (CWITG) was established as a result of the 1997 exercise which found that 17 out of 38 respondents felt that communication with Institutions was unsatisfactory. The CWITG met on three occasions and produced many recommendations for improvement under the following main headings:

(i) Improving Officer and Secretary understanding of Engineering Council Policy.
(ii) Improving contacts at staff level.
(iii) Improving Communication-Related Activities undertaken with Institutions.

(iv) Assisting in improving Institutions' members' understanding of the Engineering Council role and relationships with the Institutions.

The resource implications of the recommendations were considered and it is fair to state that some improvement in relationships did result.

Nomination and Audit Committee and Engineering Council Representatives

After forty-three meetings held between 25 November 1983 and 18 January 1996, the EngC's Nominations Committee responsible for approving the Institutions' applications to become Nominated Bodies, was reconstituted to meet the revised requirements of the post-Fairclough EngC. It was renamed the Nomination and Audit Committee (NAC), and held its first meeting on 22 March 1996. At this time, in keeping with Fairclough's idea of reducing the numbers of EngC committees, the concept was introduced of licensing the Institutions to undertake certain registration activities that the EngC committees had hitherto performed.

Among the changes ratified by the NAC was the redefining of the roles of Representatives of the EngC. As we described in Chapter 3, the Accreditation Representatives' system, originally implemented by the CEI, had been largely adopted by the BER on 9 September 1986 but with some redefinition of the roles of the AcReps and their relationship with Nominated Bodies. Basically it was the task of each AcRep to sit with a Nominated Body's appropriate committee to advise and ensure that SARTOR standards were being maintained. The system enjoyed only patchy success and several AcReps had left the team. All remaining AcReps had been briefed in March 1994 by Terry Smith, the EngC Quality Assurance Executive and their role was broadened from looking after only accreditation to covering membership as a whole – much in line with the original principles laid out in SARTOR's Code of Practice. But by that September the Nominations Committee accepted that the AcRep system had become almost moribund and so in November 1994 a new post of Compliance Executive was created to, *inter alia*, retrieve and manage the situation. James Walker was appointed and, with substantial backing from Terry Smith, began to recruit new volunteers to the team who were now, with their wider remit, termed Engineering Council Representatives (EngCReps). On 13 June 1996 the team of EngCReps was brought together for their first Seminar but soon afterwards James Walker left the EngC to join an Institution's staff.

In October 1996, the NAC redefined the roles of the Representatives and, after a hiatus, Colin Chapman, a Chartered Chemist as well as a Chartered Engineer, and former Head of Technical Training Policy for Nuclear Electric plc, joined the EngC's Membership Department as Compliance Executive in September 1997. In this role he managed the team of the 50 or so experienced volunteer Registrants acting as EngCReps. All the volunteers were nominated to the team by "their own" Institution and one or more were then allocated by Colin Chapman on behalf of the NAC to another Institution to attend specified meetings of its membership and education/accreditation committees. The EngCReps thus became an integral part of the EngC's audit of the Nominated Bodies, to confirm compliance with the conditions of their licence, with SARTOR and other requirements, whilst facilitating the sharing of best practices among the Engineering Institutions. From the early part of 1998 Colin Chapman, who had been an EngCRep himself allocated simultaneously to two Nominated Bodies, improved the effectiveness of this scheme by initiating and organising half-yearly training seminars every Spring and Autumn. This ensured that the volunteer Representatives were

kept abreast of the EngC's latest policies and procedures, and thereby were able to share these directly with the Institutions and their appropriate committee members.

To enhance the NAC's expertise, some EngC staff and members of the NAC, during 1998 and in subsequent years, were externally trained on audit activities to accepted national standards. At the same time, best practice was enhanced by working with the United Kingdom Accreditation Service (UKAS).

Twenty-five Institutions were certified by the NAC in 1996 as Nominated Bodies and given licences to process individual applicants along specific routes to registration on identified sections of the Register, and to accredit academic courses. Approval was by no means automatic as evidenced by the fact that around one in three applications for licensing was rejected. Bilateral agreements were set in place to enable those not fully licensed to pursue registration activities in collaboration with a licensed Institution. A Transition Registration Referral Committee was set up in 1996 to deal with queries from Nominated Bodies that were not fully licensed; but after one rather abortive meeting this was replaced by a Registration Standards Committee in the following year – see below.

In 1996 the Institute of Hospital Engineers, wishing to attract professionals such as architects who were not engineers into its membership, changed its name to the Institute of Healthcare Engineering and Estate Management. The Institution of Fire Engineers was granted conditional Nominated Body status in July 1996 and joined the Nominated Bodies in 1997. By the end of 1997 there were 34 bodies that had retained or gained Nominated Body status since Unification but three Nominated Bodies had lost or given up this status. A large new Institution of Incorporated Engineers in Electronic, Electrical and Mechanical Engineering was formed on 1 April 1998 by amalgamation of the Institution of Electronics and Electrical Incorporated Engineers and the Institution of Mechanical Incorporated Engineers, with the Institute of Engineers and Technicians joining after this merger. Also in 1998, the Institution of Mining Engineers merged in August with the Institution of Mining and Metallurgy, retaining the latter's title.

Two Nominated bodies failed full certification in 1998 and one new body that applied was not nominated. The arrangements for Learned Society Associates that had been proposed in 1994 to replace Professional Associates, which we described in Chapter 5, had been faltering since 1995. However, in 1998 the concept was given a different focus and revitalised as the Professional Affiliates scheme, thanks to the enthusiastic efforts of Terry Smith, now Head of the EngC's Membership Department. On 28 October the Institute of Metal Finishing and the Society of Environmental Engineers both became Professional Affiliates. To provide publicity and elaboration of the benefits of affiliation to the EngC, a new pamphlet 'Professional Affiliate: Guide to the Scheme' was published in December 1998 and soon proved its worth, as we shall see in the next chapter of this Chronicle.

Interfacing with Registrants

The Register and Communications

To maintain the efficiency of the Register and the EngC Examinations, the EngC's internal systems were reviewed during 1996. To explain to Registrants how their subscriptions were being used to promote and regulate the profession, the EngC published a 'Report to Registrants' in 1997. In addition two issues of the new regular *Engineering First*, to mark the

changes resulting from the Unification initiative, were published in 1997 and distributed to 300,000 Registrants worldwide. This well-received six-monthly magazine continued until the middle of 2001 when a cost-cutting decision was taken to make it available only in an electronic form, those responsible for the decision perhaps overlooking that the majority of Registrants read their copies of *Engineering First* at the end of the working day or week, glad to be away from their computer screens. However, in a more enlightened move to serve Registrants a new publication, the EngC *Bulletin*, was launched in November 1997. This monthly *Bulletin*, normally comprising a professionally printed double-sided A4 sheet, carried brief news of key EngC activities. It proved popular for briefing/updating the engineering profession, and gave telephone numbers for readers to glean further information.

By the end of 1997 there were nearly 300,000 professional engineers on the Register, the EngC was in partnership with 40 Institutions, and in industrial affiliation with over 100 engineering companies.

Also during 1997, the EngC launched the 'Engineering Council Digest of Engineering Statistics', covering the engineering profession as a whole. It was published in May by the Directorate for Engineers' Regulation at £40 and became a regular, annual, publication providing information on numbers of university students taking engineering and technology subjects, where engineering graduates were first employed, where engineers were employed throughout the UK and under what conditions, salaries etc. It also contained considerable detail on UK industrial performance. A chapter on Registrants to a certain extent duplicated the data that could also be found in the biennial 'Survey of Professional Engineers and Technicians'. For 1997 the latter was published in September at £95, showing that salaries of Registrants continued to rise, unemployment was falling and job satisfaction remained high.

Statutory Licensing

The idea of statutory licensing engineers as competent in specific activities had been floated on a number of occasions. It was believed by some that this would enhance the status and recognition of professional engineers. Others outside the profession saw such a move as a regrettable step towards unacceptable protectionism. The task group on Licensing of Competent Persons, chaired by Professor Ray Thompson, under the auspices of the BER and the NAC, published its proposals in May 1998, stating there should be voluntary registers of professional engineers licensed against specific functional competences. Meetings were subsequently held with the Institutions, the Health and Safety Executive and DTI to determine the way forward. The potential for recognising such schemes was discussed with the United Kingdom Assessment Service (UKAS) and the two bodies, EngC and UKAS, each sat in on some audits conducted by the other. The conclusion was that the same result was likely to be achieved by whichever body was conducting the audit/assessment but the EngC's approach was "far more gentlemanly". On the Statutory Licensing question, however, little tangible progress was made due to its inherently divisive nature.

Registration fees were increased by 4.3% in 1998 to £21 for CEng, £17.50 for IEng and £9.40 for EngTech – it was decided there need be no increase for 2000.

ECROs and PEIs

The BEP worked closely with the Institutions during 1996 in attempting to put regional programmes into place changing from the EngC-run ECROs to Institution-run Professional

Engineering Institutions (PEIs). It was intended that, based on the Institution of Civil Engineers' success with its own regional centres, a new regional network of 15 PEIs managed by Institutions would take over from the EngC creating considerable financial savings. Pan-Institution committees were created to co-ordinate joint venture projects on a regional basis. A named Institution was to be responsible for the PEI in each region involving all members of all Institutions in that region, but unfortunately the Regional Affairs IWG was unable to indicate how savings could be made. The official line, published also in the 1996 Annual Report, claimed that "no vacuum had been left", a comment vigorously challenged by many individual Registrants and others. PR support came from London with each region determining its own contribution to the Corporate Mission. This was nominally put into place in 1997, in an attempt to bring the profession, schools and industry together and encourage bright young people into the profession. Sadly this was to fail in most regions, apart from Wales and East Anglia, due to inter-Institution rivalry and lack of commitment and resources. The EngC regional offices closed during 1997, so reducing the 'Direct Charitable Expenditure'.

Bernard Dawkins a former EngC Executive Officer and a perceptive and enthusiastic long term worker for the engineering education observes:

"As a former elected member of a leading IEE Management committee, I found the members had NO knowledge or understanding of the work and role of the Engineering Council. …In the field, amongst the PEIs there was a growing feeling that the Institutions alone could not lead the engineering profession and that there was a need for leadership from "the centre", i.e. the Engineering Council. The withdrawal of funding from hosting of a number of PEIs by the ICE, in the later 1990s suggests that the Institutions left alone do not all pull in the same direction."

Again, regarding the PEI in Northern Ireland, Professor Sir Bernard Crossland, who had given sterling service as an EngC Council Member, writes:

"In Northern Ireland we had a most effective ECRO, which was supported by the Northern Ireland Training and Employment Agency. It provided a suite of offices and committee rooms in the Dundonald Training Centre, and contributed to the cost of a secretary. We also had a CPD Officer, Bill Cousins. As a consequence the local branches of the engineering Institutions worked well together, and developed close collaboration. We published an annual yearbook of events, addresses and one or two articles, all paid for by advertising, which went to each Registrant, Universities, Technical Colleges, schools and Public Libraries. We also published and circulated monthly posters of events and courses. The office was the centre for the YEB programme in Northern Ireland, which was considered to have been most successful. With the creation of the 'Reformed' Engineering Council all support for the ECROs was withdrawn, and as a result the Training and Employment Agency withdrew its matching funding.

"The PEI in Northern Ireland, which supplanted the ECRO and was supposed to be supported by the ICE was stillborn, and after the last Prestige lecture it has finally died. I am supposed to be its Patron, and when I think of what we had formerly I could weep.

"With the death of the ECRO I think that most engineers in Northern Ireland have become completely disillusioned with the 'Reformed' Engineering Council, and I guess this applies equally to the Training and Employment Agency."

This, and other sad experiences of the ill-fated PEI's, are a perfect illustration of the fact that many things are better done centrally in the engineering profession. An added misfortune, directly relating to the ending of the ECRO system and the demise of the PEIs, was the reduction of the number of volunteers acting as Neighbourhood Engineers whose noble efforts on behalf of the engineering profession had been enhanced through the network of ECROs. May the day come when the value of a centrally-supported system is wholeheartedly accepted by the various bodies involved.

Interfacing with Schools

WISE

The Women Into Science and Engineering (WISE) programme continued to grow during this period with WISE in Scotland being launched in September 1996 thanks to support from the Scottish Office. 'Wise Outlook', to promote engineering at technician level for 13-14 year old girls, was piloted in three UK areas in 1996 and, to ensure effective partnership on WISE issues between the Institutions and the EngC, a WISE sub-committee with Institution representatives was created during the year.

Following an independent evaluation of the WISE vehicle programme in 1996, confirming the effectiveness of the initiative, three further trailer classrooms were brought into service: WISE V, for 13-14 year-old girls, was inaugurated in October 1997 by Anne Campbell MP (Parliamentary Private Secretary at DTI) and, in October 1998, WISE VI was launched in Scotland by Vanessa Collingridge (Channel 5 Presenter) and WISE VII by Pam Liversidge (Senator and a Past President of IMechE). Joan Ruddock, Minister for Women, visited a WISE vehicle in 1998 just before the Government abolished her post. The WISE vehicle programme was run by Nottingham Trent University on behalf of the EngC.

WISE Conferences were held during 1997 at Dudley College of Technology and St Asaph, North Wales, and in 1998 in Bristol in collaboration with Rolls-Royce and Matra-BAe Dynamics to encourage more girls and women to consider careers in science and engineering. WISE-related publications achieved high-level recognition and attention during this period, several being launched by Government ministers. 'Cracking It', an EngC handbook for women in science, engineering and technology, targeted at women students and engineers, was unveiled in 1997 by the Rt Hon Margaret Beckett, President of the Board of Trade. The book was sponsored by the DTI, EMTA, Wellcome Trust, EEF and the Association of the British Pharmaceutical Industry. In 1998 Mo Mowlam, Secretary of State for Northern Ireland, launched in Belfast the EngC brochure 'A Career as a Woman Technician has never Looked so Good' containing available opportunities, while the 'Directory of Initiatives 1999 – Women into Science and Engineering' was published in November 1998 in a new format.

Neighbourhood Engineers

By 1996 the 'Times Educational Supplement School of the Year Award' that we mentioned in the previous chapter, for teaching excellence achieved through working with the EngC's Neighbourhood Engineers, was in its 4th year and brought in yet more entrants.

The Neighbourhood Engineers local coordination was mostly contracted out in 1996 under partnership arrangements either with Science and Technology Regional Organisations (SATROs) or Education Business Partnerships, which were already managing school and

industry projects with support from Neighbourhood Engineers. Over 1,000 young engineers from several Institutions were targeted during the year, 300 of them female, as potential new volunteer Neighbourhood Engineers. By the end of 1996, with a budget of £500,000, 2,069 secondary and 230 primary schools were in the scheme supported by an impressive 13,000 engineers and technicians. In 1996 the newly formed Young Engineers' IWG sought to determine how young engineers' views were best identified, reporting its findings to the BEP.

In 1997, with 2,000 schools supported by 8,500 engineers and technicians, the programme was managed by industry schemes such as Industry Projects – Understanding Technology (INPUT), Creativity in Science and Technology (CREST), and Young Engineer Clubs. To advertise and explain the programme to potential participants, the booklet "Neighbourhood Engineers – Practical Support for Schools" was published in January 1997 and a conference for Neighbourhood Engineers' managers was held in Scarborough on 22/23 October 1997. During that year a Schools Institution Working Group was created by the BEP to examine the Neighbourhood Engineers scheme. It was hoped to recruit many Young Engineers through PEIs and Institutions, because by the end of 1998 although there were still some 2,000 schools, they were supported now by only 8,000 engineers and technicians partly, as pointed out above, resulting from the collapse of the PEI plans.

Young Engineers for Britain

A record number of 1,250 young people (11-19 year-olds) entered projects and inventions for the Young Engineers for Britain competition in 1996. The national finals were held at Heathrow Airport. The competition was won by Adam James (18) from Y Pont Comprehensive School, Mid-Glamorgan for his invention of a plastic wrist brace. The award was presented by the Duke of Kent. The competition was organised jointly by the EngC and SCSST and widely reported in the media. Many companies contributed financial and other support.

In 1997 the YEB competition was extended to include young people up to the age of 25 and again there were a record 1,350 contestants. The national finals [the biggest and best ever, the reports said] were held at the Commonwealth Institute Conference in London. The winner was Robert Thorpe (18) from Eckington School, North Derbyshire who invented a pair of handshears that could be used by disabled people. The award was presented by James Dyson, the internationally-renowned inventor and design engineer. On this occasion YEB was organised by the EngC in association with the YE movement of SCSST.

In 1998 over 1,000 competitors (aged 11-25) entered projects and inventions. The competition was won by a four-boy team from Merchiston Castle School, Edinburgh for inventing a computerised lighting-control system for small theatres. The National Finals were held at the Commonwealth Institute Conference Centre in London. The award was presented by Lord Putnam, film producer and Chairman of the National Endowment for Science, Technology and the Arts. For this year YEB was organised in association with ASSET's Young Engineers' Clubs which had many supporters.

Other Schools' Developments

The advisory General Education Committee (GEC) provided the BER with expertise in the school sector during this period, primarily concerning itself with the national curriculum. For example, a report 'A Mathematical Foundation' was published jointly by the EngC with the

Society of Education Officers and SCSST in 1996, recommending measures to improve the teaching of mathematics in schools, and 'Technology in Secondary Schools' was published in March 1997. Discussion on technology in secondary education continued, although the GEC drew up new terms of reference early in 1998 to take account of the EngC's overall interests in the education of 3-19 year olds. This led to an EngC general education 'Vision' document. The GEC was involved in a Qualifications and Curriculum Agency (QCA) group looking at Design & Technology in the National Curriculum, including A/AS level criteria.

During 1998 the EngC also discussed its concerns over the National Curriculum with Baroness Blackstone (Minister for Education) in engineering higher and further education and with Estelle Morris (Minister for Schools). In 1998 the EngC, through the BEP, contributed resources and support to engineering coordinating groups, including Science Engineering and Technology Network (SETNET) and Quinco (the campaign to promote engineering).

However, late in 1998 it became apparent that the subject of Design and Technology was likely to be diluted in the statutory framework at Key Stage 4. Accordingly, Dr Rudge wrote directly to David Blunkett, Secretary of State for Education and Employment, expressing concern at the proposals and this did result in some favourable amendments.

The EngC published 'Part One GNVQ in Engineering' in December 1998.

Technology Enhancement Programme

The TEP had been extremely successful with its unit at Middlesex University now supplying information and experimental kit at modest prices to more than 1000 schools.

The contract from the Gatsby Charitable Trust to manage the TEP ended as originally planned in 1996, but the success of the enterprise meant that Dr John Williams, who had managed the TEP for the EngC, transferred to Gatsby where the work continued under direct Gatsby management. In this case also, the General Education Committee acted as a link to the BER. The ending of activities in collaboration with the Gatsby Charitable Foundation and the EOSG caused a reduction of £1.3m of Gross Income Receivable by the EngC, although related commitments were reduced commensurately.

Further and Higher Education

The New BER

In 1996 the new Board for Engineers' Regulation (BER) took over from the previous Board for Engineers' Registration and assumed responsibility for implementing the final stage of the Council's Review of Engineers' Formation. This had been launched by a discussion document in 1993, resulting in the subsequent 'Competence and Commitment' statement of January 1995 [see Chapter 5] prepared for the BER by its then Director, Professor Keith Foster.

The first Chairman of the new BER was Senator Robin Wilson, a former President of the ICE. The powers of the new BER, provided under the Bye-Laws, as we have already seen, were to set standards and criteria for registration, maintain discipline and appropriate conduct within the profession, determine which organisations could become Nominated Bodies,

suitably audited and licensed. These powers were delegated to executive committees. Comments from many quarters on 'Competence and Commitment' influenced early drafts of a new edition of 'Standards and Routes to Registration' (SARTOR), – as we described in Chapter 5.

To facilitate the move to licensing of Institutions as Nominated Bodies, a comprehensive review of acceptable qualifications for candidate registration, undertaken by Terry Smith, resulted in the publication of Individual Case Procedure (ICP) Guidelines for Chartered Engineer, Incorporated Engineer and Engineering Technician. These guidelines would, with hindsight, have been more correctly termed Registration Guidelines. The philosophy of licensing (as opposed to nomination) was that Institutions would undertake *all* of the work associated with registration – including those parts of the candidate assessment formerly conducted by the EngC. The ICP Guidelines drew heavily on the knowledge of the Chairmen of the former CCC and CCIT, Professor Len Jones and Brigadier Lonsdale, as well as on the expertise of Philip Hawkin, Chairman of EGC4, Dr Denys Armstrong and Mrs Connie Topping, the EngC's Qualifications Executive. Dr Armstrong's outstanding contribution as a volunteer to the EngC was recognised in 1996 when he was presented with a Rose Bowl, the EngC's highest award.

This is an appropriate point at which to mention the vast amount of unpaid peer assistance that Registrants and others have given to the EngC over the years. Without the time and expertise that these volunteers have freely given to its committees, working groups, panels and other activities, the EngC could never have pursued its policies or achieved its aims and objectives.

The new BER contributed in 1996 to national developments in further education and higher education and qualifications. These included implementation of the Dearing Report (qualifications framework for 16-19 year-olds), the Beaumont Report (NVQs) and the Capey Report (GNVQ assessment), and also the transition from the EOSG to its successor body the Occupational Standards Council for Engineering (OSCE). The OSCE was formally established in 1997 with representatives from industry, national training organisations, professional bodies, universities and trades unions.

In its work in regulating the profession during 1996 and 1997, the BER maintained close links with the Institutions' NVQ Forum, the Joint Board of Moderators and the Joint Accreditation Board operated by co-operating groups of licensed Institutions and bodies representing higher and further education. To undertake its programme of work the BER set up a number of task groups or committees. In 1996 this work involved marketing the Register and reviewing the activities of the Statutory Powers Working Group – embracing a study of EN 45013 (certification of competent persons), reviewing the Code and Rules of Conduct, embracing CPD and the EngC's existing Codes of Practice, one relating to risk and another to the environment. In September 1996, the accredited list 'Engineering Courses – the 1997 Official Guide' was published and in February 1997 'Engineering Our Future' was published in association with the EEF and the DTI.

The BER also continued in its remit to regulate the profession in 1997 by setting up executive committees in the areas of Nomination and Audit, International Affairs and Registration Standards. It master-minded the development of a third edition of SARTOR, at the time known as SARTOR97 but later termed SARTOR-3.

The SARTOR-3 Story

Under the auspices of the previous Board for Engineers Registration the first edition of Standards and Routes to Registration (SARTOR) had been published in 1985 with a revision in 1990. On both occasions Professor Jack Levy, the Director Engineering Profession, his deputy Brian Senior and the Executive Ena Duffley who had transferred from the CEI, had been the staff team responsible.

Under the guidance of Professor Keith Foster, Institution Working Groups (IWGs) produced in 1993 the discussion document 'Review of Engineering Formation' followed by the 1995 policy statement 'Competence and Commitment' – as we described in Chapter 5. Following Professor Foster's retirement and the relatively brief tenure of Robin Bond, Director General Mike Heath invited Professor Levy to return temporarily to expedite a third edition of SARTOR. Professor Levy agreed, imagining that this call out of semi-retirement would be for a few weeks but in fact turned out to be some 9 months!

Fortunately a new Deputy Director, Engineering Profession had been appointed, Dr Judith Secker, who came to the EngC from The City University, as coincidentally had Professor Levy. Together with Senior Executive Peter Swindlehurst, an experienced education and training professional, this team was well placed to advise the SARTOR IWG not only on proposals for the new SARTOR but on its gaining general acceptance by the Institutions, universities and employers. The IWG was under the chairmanship at first of Senator Professor David Fussey of the University of Greenwich and then of Senator Professor John Spence of Strathclyde University. Both these chairmen put in an immense amount of voluntary work to assist the development of the document and the consequent complex negotiations with Institutions and other interested bodies.

After much discussion and many meetings of the IWG agreement was reached for raising the qualification standards for CEng, IEng and EngTech. These relied heavily on those developed for 'Competence and Commitment' [see above] but had a significant number of differences to make the changes more palatable and easier to comprehend. SARTOR-3 fully retained the 'ladders and bridges' approach of the original SARTOR, enabling students and other candidates to add to their qualification level. Qualification would be in three stages – (1) academic, (2) a combination of training and experience [now termed initial professional development] and (3) a professional review to confirm competence and assess commitment.

The exemplifying *academic* standards were determined as:

for CEng……an accredited 4-year MEng degree or a 3-year BEng plus a 1-year "matching section";
for IEng…… .an accredited 3year degree or an HND plus a 1-year "matching section";
for EngTech …..a recognised National Certificate.

Matching Sections

The term "matching section" had been coined by Professor Levy much earlier and had appeared in the first edition of SARTOR. The term was now given added emphasis to express the idea that for those with a qualification which fell short of that required, appropriate further study would, at its beginning, match their existing level and at its end match the subsequent career target. It could take various forms according to the requirements of the

candidate. The term was subsequently endorsed, emphasising that it would have demonstrably to bring the candidate to the appropriate exemplifying standard.

Entry Requirements

A further provision taken over from 'Competence and Commitment' was that of specifying minimum entry requirements to accredited courses - there was mounting evidence that some universities, to meet their requirements for funding, had dropped their entry standards to extremely low levels, resulting in large drop-out rates or dubious output standards. The exemplifying entry standards in SARTOR 3 were declared as:

> for MEng courses 24 'A-Level' points equivalent to 3 grade B passes;
> for BEng(Hons) courses 18 'A-Level' points equivalent to 3 grade C passes;
> for degree courses leading to Incorporated Engineer, 11 'A-Level' points.

The entry standard requirement turned out to be by far the most contentious provision in the new SARTOR with around 80-90% of the comments and objections being related to this. When the university Vice Chancellors were invited to consider the SARTOR97 draft, only six out of about 100 were in favour. However, a prior copy sent for comment to the DTI [still the EngC sponsoring Government Department] had elicited only one observation - the specified entry standards for IEng were too low! The Royal Academy of Engineering also indicated broad support in a letter of 24 February 1997.

All those universities that felt their students would not meet the requirements – and there were many of them, especially the former polytechnics – argued, for example, that students from deprived backgrounds should be given a chance and that judgement should be made on output rather than input standards. This sounded persuasive until the practicalities were considered.

The IWG continued its work in the teeth of opposition but to help meet such points SARTOR-3 policy was modified on the basis of creating a "teachable group". This was a term introduced by Dr Judith Secker to denote a group of students of sufficient academic strength to be able to assimilate the material at the necessary rate, yet allowing some late developers to participate. Accordingly a "teachable group" was defined as one where at least 80% of the class reached the exemplifying entry standard. The other 20% could be admitted at the discretion of the university and would not affect the case for accreditation. Also, to give time for university engineering departments to acclimatise, the 80% rule was phased in, beginning with 50% for the 1999 entry.

The Engineering Professors' Council (EPC) was, at best, ambivalent about setting input standards, many of their members coming from the post-1991 universities – the former polytechnics where, in general, student aptitude as measured by 'A' Level grades was lower than that accepted by the older universities. EPC members voiced the view that the emphasis should be on *output* standards - though that of course was part of the purpose of the accreditation process. The EPC established a working party to develop an output standards approach and over the next few years produced a number of perceptive and useful papers which complemented SARTOR-3.

Progressing SARTOR-3

The EngC team made many presentations on the draft SARTOR-3 proposals to Institutions, university engineering faculties and organisations such as the Engineering Professors' Council. One such meeting at the House of Commons under the auspices of Nicholas Witchell, of the House Science and Technology Committee, attracted such a large internal and external audience, some coming long distances, that many were locked out. A hastily scheduled repeat performance later the same evening avoided an embarrassing scene.

These presentations, although sometimes leading to heated arguments particularly on the entry standards issue, generally had a beneficial effect so far as the perceived national good sense of the SARTOR-3 proposals were concerned. Other helpful moves included a supportive letter to the chairman of the University Grants Committee signed jointly by the Vice-Chancellor of Cambridge University and the Rector of Imperial College, London. This helped to counteract the negative signals emanating from some other universities.

The BER approved Part 1 [the policy part] of SARTOR-3 in September 1996 for endorsement by the Institutions' Councils. Comprehensive back-up documents were issued in Part 2 [the implementation part], largely prepared by Peter Swindlehurst, covering such matters as academic equivalencies and accreditation procedures. These were mainly for the use of membership departments of Institutions and admissions officers in universities. The complete document (Parts 1 and 2) was authorised by the BER on 11 September 1997 to take effect in September 1999, but formal endorsement by the Senate was delayed until it had been checked against the Dearing Report of the National Committee of Enquiry into Higher Education.

In the event, the third edition of SARTOR was published on 11 September 1997, supplemented by Guidance Notes, and launched in October at a well attended national press conference addressed by Robin Wilson, Chairman of the BER in the presence of the EngC Chairman Dr Alan Rudge and Director General Mike Heath, all of whom had been constant in their support and encouragement of the raising of standards implicit in the new policy statement. The "Routes to Registration" are shown in Fig.10 and can be compared with the original SARTOR routes of Fig 5. 'Standards and Routes to Registration (SARTOR), 3rd edition' was soon made widely available, priced at £50 per set of two parts.

Although the specification of entry standards was, as has been said, the most controversial aspect of SARTOR-3, it was not, in fact, the most significant. Of far greater importance in thelonger term was the raising of the standard of Incorporated Engineer to a 3-year accredited degree. The basic purpose, besides reflecting the need for a longer course, was to raise the status of Incorporated Engineers and the attractiveness of this qualification to school leavers.

The "Different but Equal" concept for CEng and IEng was the theme of much subsequent publicity given to the IEng qualification by the EngC and by some of the Institutions. A leaflet on the lines of Fig.11 was widely distributed to employers and schools portraying CEng as "Knowledge-based, with appropriate Know-How" and IEng as "Know-how based, with appropriate Knowledge". As early as April 1996 the Institution of Electrical and Electronic Incorporated Engineers had published a booklet 'Degrees for Incorporated Engineers' listing 22 existing accredited courses for IEng.

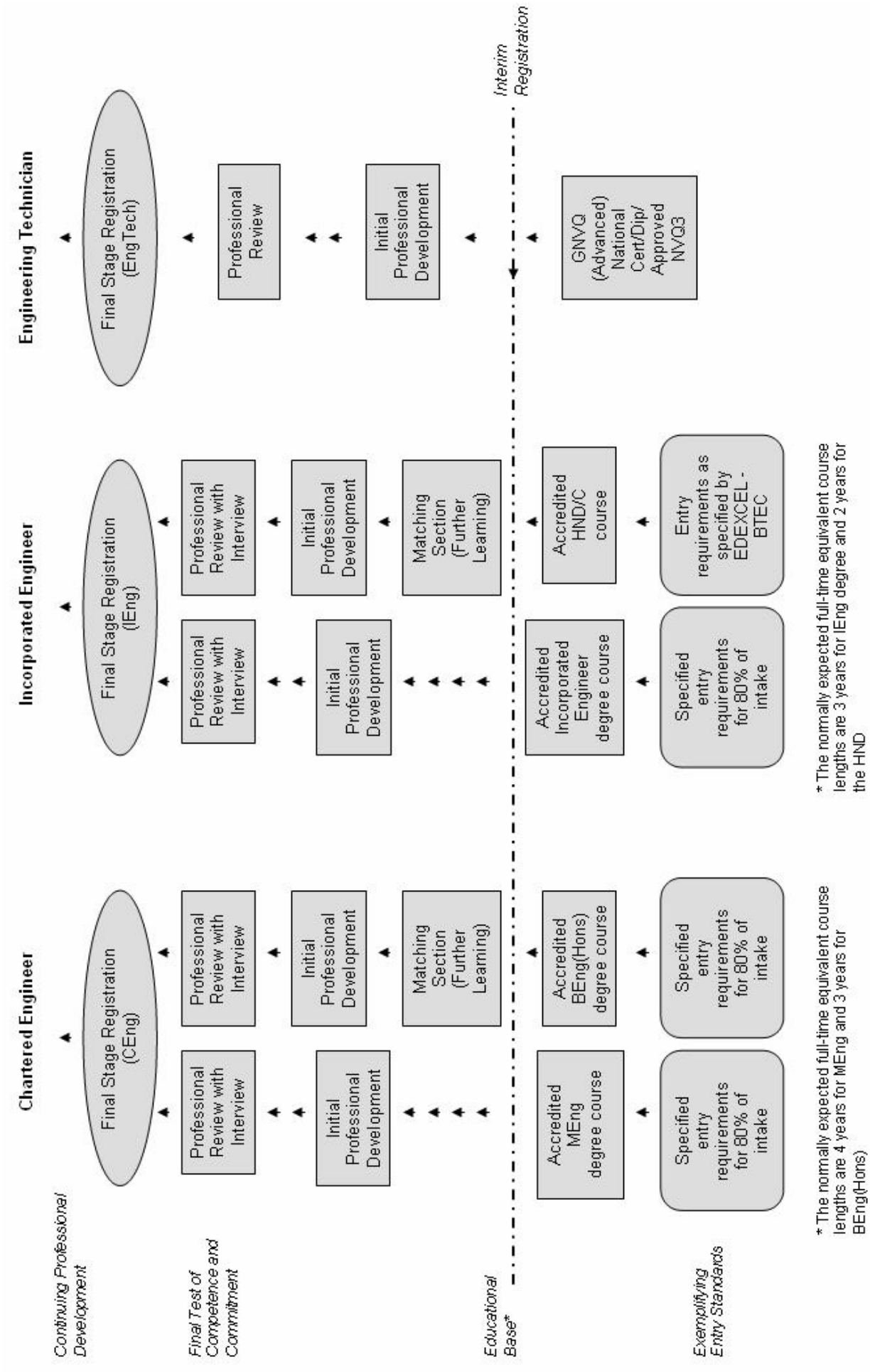

Fig.10 Benchmark Routes to Registration 1997 – SARTOR-3

Shortly after the publication of SARTOR-3, Professor Levy retired from the EngC for a second time his task having been completed, although he remained as a consultant until the end of 1998. He was succeeded as Director of the BER by Andrew Ramsay, a Chartered Secretary and a Chartered Engineer, and the Secretary of CIBSE at the time. Immediately prior to the Fairclough reforms of 1996 Andrew Ramsay had chaired regular meetings of the Secretaries of the 12 largest Institutions. As these meetings had been concerned with advising on the structure and Byelaws for the reformed EngC Andrew Ramsay was well versed on the latest developments.

A Registration Standards Committee (RSC), under the chairmanship of Geoff Fuller, was established in 1997 to replace the moribund Registration Referral Committee and monitor SARTOR-3 and maintain Part 2 of this document, its members being nominated by the BER and the Institutions. The RSC held its first meeting in December and set up some task groups. This Committee also prepared several "second issue" documents, masterminded by Peter Swindlehurst, which were distributed in June 1998.

A National Seminar on SARTOR-3 was held in 1998, widely attended by universities and the Institutions but regrettably not a few found it disappointingly unhelpful. Nevertheless, the EngC created a comprehensive library of source materials in 1998 and funded research into the early impact of SARTOR-3, incidentally discovering that a high proportion of Registered Engineers included directors or chief executives of the FTSE 100 companies.

In 1998 then, the BER set the new standards and criteria for the registration of CEng, IEng and EngTech. Close links continued to be maintained, as in the previous two years, with the Institutions, the NVQ Forum, the Occupational Standards Council for Engineering, Joint Accreditation Boards and bodies representing engineering Higher Education and Further Education. The EngC met with engineer Vice Chancellors to discuss degree output standards, a continuing concern on all sides for a variety of reasons. The Engineering Professors' Council, still not reconciled to the specification of entry standards, continued its research study with the aim of defining and assessing output standards as an alternative method of accreditation.

Opinions on SARTOR-3

Mike Heath:

"During 1996, there was some concern about the attitudes of our international colleagues because of our perceived failure to match up to world standards. That these concerns have now dissipated owes everything to what I regard as the single greatest achievement of my period in office. That was the revising of SARTOR to challenge the educational standards and structures currently prevailing in Britain and fundamentally to raise the standard for registration as an engineer in the UK.

"The SARTOR revision had to be handled as a major campaign against determined opposition from many in the Institutions and virulent opposition from many in the academic community. The vested interest of the Institutions was that they might suffer reduced numbers of members and, therefore, income. To be fair, however, there were many who

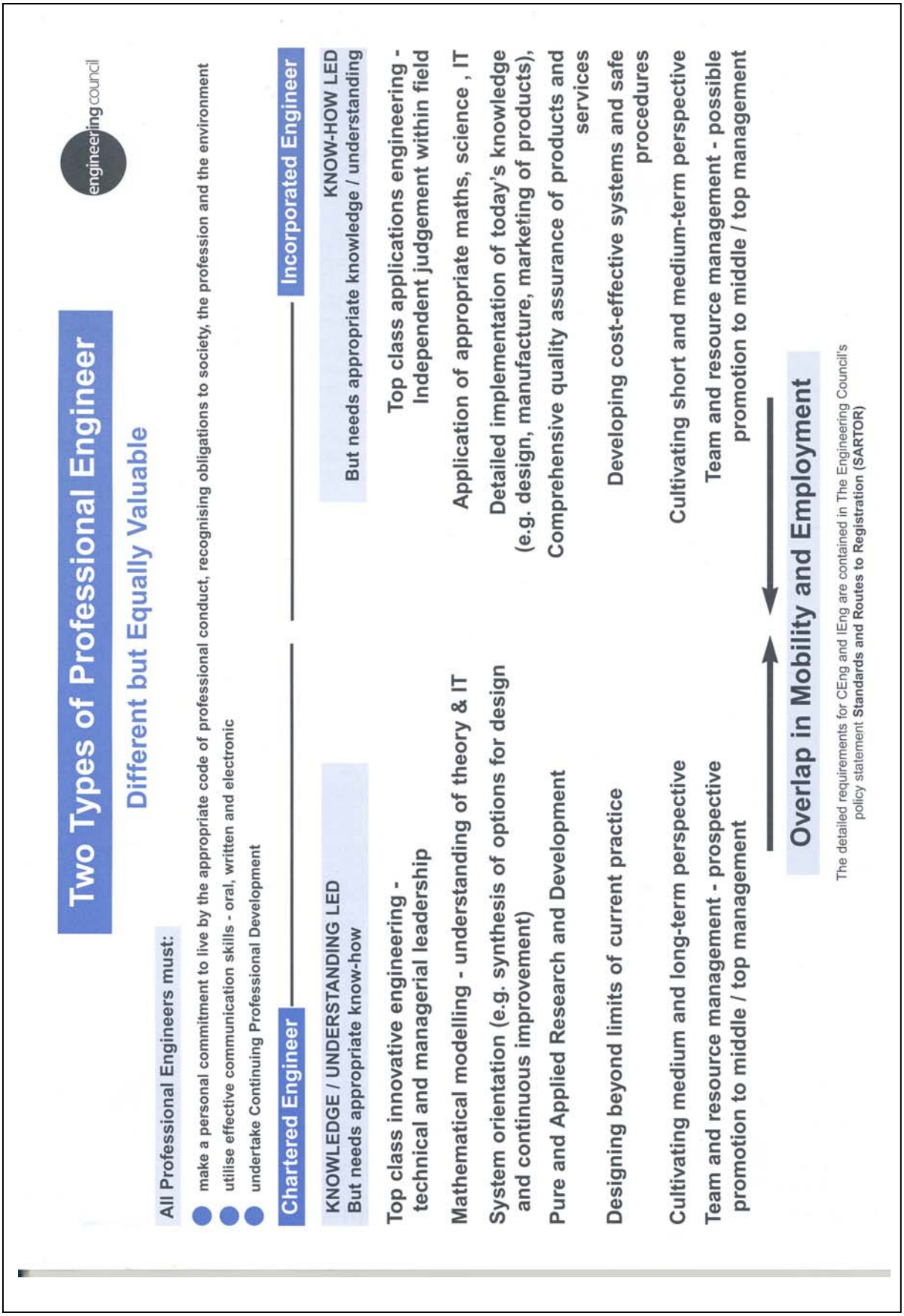

Fig. 11 Two Types of Professional Engineer

entirely supported the thrust from the start. The academic community's fear was that engineering departments might shrink or even close with renewed competition for students bright enough to cope with the increased standards. For some universities and colleges, this was real enough.

"Our view throughout was that low standards would be counter-productive, even by the narrow standards of self-interest used by many protagonists, and leave us with a club that no-one would think it worthwhile joining. A well-judged challenge would, on the other hand, stimulate the right sort of young people with the necessary ability and preparedness to work hard. Although some compromises had to be made, nothing fundamental was sacrificed and in the end wide agreement was achieved. I am clear that history will judge this as a fundamentally important step in the development of the Profession."

And this is from David Rogers, a civil engineer with long service on EngC Qualifications and International Committees:

"The first two versions of SARTOR were probably fairly innocuous and didn't make many waves among the larger Institutions, all of whom had a qualification process that was not widely dissimilar. The major impact was probably felt by the smaller Institutions, but they all appeared to respond positively.

"A major change was the publication by the EngC of *Competence and Commitment*. There were several concerns, one of which was the dramatic increase in entries to university education, the removal of the binary divide between the universities and polytechnics, and the fear that there was some lowering of standards. The Government initiative on GNVQs was taking place and the EngC had recognised that there would be an increasing number of pathways to reaching professional engineering status.

"Whilst *Competence and Commitment* tended to devote much space to NVQs, the chapter on the concept of competence and commitment was – with hindsight – a very profound statement. It led to the development of SARTOR-3 which was due, and which resulted in an attempt to bring CEng standards back to earlier levels and also establish a much clearer role for IEng, which had always been difficult to "sell" to the Profession. The rapid expansion of electronic communication and manipulation assisted this.

"The writing of SARTOR-3 was a considerable exercise and succeeded only with a major input from the Institutions. The two-part document was generally accepted as a firm basis for ensuring the reinstatement of standards, but the one area that caused a furore was the requirement for entry standards for accredited degrees. It was the only area where numbers were used - perhaps this is the only thing that engineers understand!! - and the usual arguments about no correlation between entry standards and output standards were trotted out. Curiously none of the academic critics could explain why, if entry standards were so unreliable, they continued to use this method when offering places to potential students!!

"By 2001 SARTOR-3 had settled down pretty well, but there were still some Institutions who continued to grumble. What it showed up was a continuing and rather worrying problem. Within all the Institutions there was a small group of members and staff who understood the details of the qualification process and the constitution of the EngC and how it worked. These were the people who sat on EngC committees and working parties and without whom nothing ever got done. However, there existed a very considerable gulf between this group and the

"establishment" body within so many Institutions, who often did not understand their own qualification scheme and certainly had little understanding of the EngC and remained suspicious about what it was up to."

EngC Examinations

An Examinations Working Group reviewed the EngC Part 1 examination syllabus in 1996 and recommended changes. It was decided in 1997 that the EngC examinations would add a Part 3 to meet the SARTOR-3 standard – the raising of exemplifying academic standard from BEng to MEng. This amounted to an extra year of full-time study consisting of two further papers from the Part 2 (A) list plus one cross-division paper on Advanced Engineering Analysis plus a choice of one paper from six advanced syllabi plus a project to demonstrate team work. A Part 1 examination under the old syllabus was held finally in November 1998 and the new syllabuses came into effect in May 1999.

Professor Alan Bramley writes:

"I was involved with the Engineering Council examinations, and after serving as a Moderator for a short while I was appointed as Chairman of one of its Boards.

"The Engineering Council examinations were taken throughout the world, and as with any formal examination process one had to guard against plagiarism, cheating, etc. Whilst one would not want to venture into the jungle of overt information about the tricks that some people got up to, I do think that it was rather amusing that the examinations had to be scheduled to coincide with the time changes around the world. This, I think resulted in some quite bizarre arrangements whereby people were taking examinations at odd hours of the day and night. Brian Millicent had it all worked out in some detail. The interesting thing about this was the way in which information technology could have been used very effectively to transmit information from one location to another if this synchronisation process had not been embarked upon."

The requirements for the examination were developed by the EngC in line with the progressive raising of SARTOR standards and hence Institution membership requirements for CEng, as we indicated in Chapter 2. Thus by 1998 the examination arrangements were:

Part 1	Compulsory subjects:	Mathematics Engineering Materials Engineering Science Engineering Perspectives and Skills
	Optional Subjects (2 from):	Mechanical and Structural Engineering Thermodynamic, Fluid and Process Engineering Electrical and Electronic Engineering Software and Information Systems Engineering

Part 2 (A) 5 three-hour written examination papers chosen from a list of 27 that covered all the main branches of hardware and software engineering.

Part 2 (B) A single subject 'The Engineer in Society' which was compulsory.

Part 2 (C) A report on an engineering project that the candidate had proposed and undertaken.

In that year, 1998, there were 336 UK and 2,729 overseas candidates in 35 countries taking the examinations. Many of these overseas centres, however, had fewer than 10 candidates. For example there were 2 candidates in Texas and 1 in Moscow. Over the years there had been a steady decline in the numbers taking the examination. In 1988, for instance, the numbers of UK and overseas candidates had been respectively 708 and 3,060. The decrease simply reflected the growth of opportunity for UK students to enter university, and correspondingly for some countries in the developing world to have established their own higher education systems.

The EngC and the profession generally were reliant upon literally hundreds of engineering academics who gave their time and effort to the Examination for little more than their expenses. By their efforts they provided priceless opportunities for tens of thousands of young people from all over the world. In particular, successive chairmen of the Part 1 and Part 2 Boards of Moderators carried a heavy responsibility in considering for final decision the recommendations of the numerous Examining Boards. Professor Avinash Bajpai (1983 to 1989), Dr Denys Armstrong (1983 to 1997) and Professor Colin Davidson (to the Summer of 2001) deserve a hearty vote of thanks for their creative involvement.

In 2001, as candidate numbers were falling and less income was being realised, the decision was taken to devolve the actual running of the Examination to the City and Guilds of London Institute making economic use of their extensive overseas network although the setting and marking of the examination papers remained within the EngC.

Continuing Professional Development

The Continuing Professional Development (CPD) Forum continued in 1996 and 1997 to provide opportunities for taking joint action and for sharing experiences. In 1996 the EngC aided the linking of Occupational Standards and competences with CPD, and the use of a systematic approach for engineers to manage their CPD. A CPD package on Energy Management was launched in collaboration with the Institute of Energy and the 'Best Practice Programme'. From this year engineers who were involved in school-based work were encouraged to take the City and Guilds Foundation Certificate in Teacher Training and Development – an NVQ level-3 award. This was recognised by IMechE and IEE as contributing towards CPD.

In keeping with aim of the Activity Review to facilitate greater involvement of the Institutions, the EngC's CPD operations in the regions were run down during 1996 although they continued in Northern Ireland with funding from the Training and Employment Agency. It was intended and agreed that promoting and supporting CPD should be developed as an Institution responsibility.

A CPD Conference, 'Competence and CPD; the Business Benefits' was organised jointly in November 1997 by the EngC and IIExE and supported by DTI, the Institutions and other bodies. Developments in CPD, good practice in industry, and linking CPD to competence standards, were among the topics discussed. This resulted in the Code of Practice for CPD being amended in 1998, emphasising links with occupational standards. In this year the CPD

Forum was reformed into the Professional Development Forum, placing increased recognition on employer interests.

In 1998 the EngC endorsed the response by IStructE [on behalf of the Profession, which was submitted jointly with EEF to the Secretary of State] on the Government Green Paper on Lifelong Learning.

Interfacing Internationally

The EngC's new International Committee, which replaced the British National Committee for International Engineering Affairs in 1996, continued to represent the United Kingdom at events of FEANI, CEC and WFEO and also act as the United Kingdom's point of contact for the European Higher Engineering and Technical Professionals' Association (EurEta).

Sir John Cullen retired as Chairman of the International Committee in 1996 and in early 1997 Dr Les Mercer, a Senator, was chosen as its Chairman. Brian Mott (IEng) was Vice President of EurEta. Professor Levy, the pro-tem Director, Engineering Regulation, was also the Secretary of the EngC's International Committee and Matthew Dixon joined the EngC as International Consultant following the untimely death of Peter Hector.

During 1996 the UK Government enacted new regulations which gave effect to the 'Second Directive' of the EU – the free movement of EngTech level engineers throughout Europe.

With regard to FEANI at this time, Senator John Cullen became its new President and took office in June 1997. Its head office moved to Brussels with a new Secretary General. In September FEANI set up a task force to review the form and appeal of Eur Ing to reflect the changing pattern of courses in Europe. In 1998 the EngC's International Committee supported FEANI's efforts to enhance the Eur Ing title and to maintain links with EurEta and the Washington Accord. The Washington Accord, now with Hong Kong and South Africa making eight participating countries, began to consider moves towards the Engineers' Mobility Forum which would lead to mutual international recognition of full professional qualifications such as CEng and PE and not just of their accredited academic component. But in accordance with the Activity Review [see above], and over-riding the objections of Professor Levy, the EngC withdrew from the WFEO and considered withdrawing from the CEC because of their perceived ineffectiveness. With hindsight it can be noted that such moves were not in accordance with the EngC's 1997 MOU with Government.

As mentioned earlier in this Chapter, the Professional Young Engineers (PYE) associated with the EngC became quite involved with international events during this period. In June 1997 they sent representatives to the European Young Engineers' (EYE) Council in Copenhagen at which the UK became the 11th nation to join. In October PYE helped to organise a seminar in Edinburgh for Young Engineers from the Commonwealth; those present prepared a declaration that was tabled for the Commonwealth Heads of Government meeting on the following day. In November the UK assumed the Presidency of the EYE Council at its meeting in Karlsruhe and in June 1998 the UK hosted the EYE Council conference in London.

In summary on the international front Mike Heath the Director General at the time concluded:

"Our work with the international engineering community went well and we held the ring despite hostility from the major Institutions who felt that this was an unjustifiable use of Engineering Council resources. Air fares, hosting delegations and so on certainly presented a substantial burden to the Council but one that in my view was inescapable."

Interfacing with Industry

The Industry Affiliates

The Industry Affiliate (IA) scheme was rejuvenated during this period thanks largely to the efforts of new EngC staff member Clive Coker. In 1996 an Industry-Institution WG looked at the scheme and the programmes of the Institutions' Industry Affiliates, and decided against combining these but to revise the EngC scheme and re-launch it in 1997, the BEP having prepared some promotional literature. The first ever Industry Affiliates' Seminar was held, discussing the impact of SARTOR-3 on UK industry. Responding to an immediate need, a 'Millennium Date Change' forum, held for the benefit of industry on 12 December 1997, was opened by Barbara Roche MP and attended by 200 people. Also at the end of 1997, an advertising campaign was mounted for new IAs. A "discussion club" meeting was now being held every month for IAs, and by 1998 the Industry Affiliates' Club was meeting as a regular forum and met five times in this year and discussed topics such as skills shortages, Foresight, licensing of Competent Persons and a national minimum wage. A promotional booklet 'Industry Affiliate Scheme – a guide to services' was published in December 1998.

The IA scheme service, presentation and marketing had been improved during 1998 by launching a new logo and introducing a new dedicated web-site to improve communications with members. The *Industry Links* newsletter was re-launched earlier in the year and members were invited to contribute articles or advertise free of charge in this. In June the IAs and BCS jointly participated in a forum at which Francis Maude spoke on 'EMU and the Euro and the implications for British Business'.

Arrangements were set up by which the EngC's Professional Affiliates were invited to meetings of the Industrial Affiliates, so providing means of encouraging many useful exchanges of ideas. The EngC was complimented by many of those attending for facilitating these discussions.

Interfacing with the Public

Public Affairs

In the period from 1996 to 1998 the EngC developed a deliberately higher profile in the political arena. Each year, for example, Public Affairs staff, as well as EngC Directors attended the three main political party conferences in the Autumn. From 1997 engineer MPs were regularly briefed [using ICE premises in Westminster] and in 1998 the EngC attended the TUC conference. Throughout this period the EngC responded to Government consultation documents and submitted evidence to Select Committees in collaboration with the Institutions and Industry Affiliates. This could be interpreted as action taken within the EngC's 1997 Memorandum of Understanding [Annex G] with the Government.

In response to the Government's 1996 White Paper on Competition, the EngC urged that the UK should exploit the potential for IT, electronics and communications to be able to remain

competitive internationally. Then, during 1998 the EngC was closely involved in over 40 consultation exercises, coordinated by Institutions on its behalf. The EngC made submissions to, and met with officials of, the National Skills Task Force, the Qualifications and Curriculum Agency, the Quality Assurance Agency, the Department for Education and Employment including Estelle Morris, Minister for Schools. Advice was also given in 1998 to staff at the Teacher Training Agency and the University for Industry. Evidence was presented in this year to a House of Commons Select Committee on Innovation. The EngC called on Government in 1998 to heed the Profession's views on setting up a Food Standards Agency. Safety awareness issues were discussed with Jenny Bacon, Director General of the Health and Safety Executive.

Although 1997 had been designated the Year of Engineering Success (YES), unfortunately the EngC was so preoccupied with the aftermath of the Fairclough Initiative that it let this opportunity slip by almost unmarked. It was claimed in the EngC's Annual Report that the momentum generated by YES, with follow up initiatives, was set to run for at least the next five years. But there was little evidence of advantage being taken of this, as Dr Hawley discovered in 2000 as we shall see in the next chapter of this Chronicle.

Even so, in 1997 the EngC focussed on improving the media's reporting of the profession; it instigated a national marketing campaign with the Engineering Employers' Federation (EEF) and the Engineering and Marine Training Authority (EMTA). Four task groups were set up in 1997 to look at Marketing of the Register, Licensing of Competent Persons, Reviewing the Code and Rules of Conduct (including CPD), and establishing a new category – Professional Affiliate by which a professional engineering body could have links with the EngC. During 1998 there was widespread and positive media coverage of EngC core events and campaigns: the EngC appeared on the BBC Radio 4 series 'Profiling the Profession' and in April, Marie-Noëlle Barton, the EngC Executive in charge of WISE, campaigned on BBC TV news for more employers to adopt family friendly policies.

The 'Ivanhoe Guide to the Engineering Profession' was published in October 1996 for 1997, and in October 1997 for 1998. It carried the EngC logo, forewords by EngC Chairman Alan Rudge and articles, many of which were written by EngC staff members. In September 1997, 'Engineering Opportunities 1997-98' was published, repeated in the following September by 'Engineering Opportunities 1998-99'.

To further promote the EngC's activities in December 1997 an 'Engineering Council' brochure was published, followed in July 1998 by 'Engineering for People'.

Quinco, the Campaign to Promote Engineering, was formed in December 1997 and formally launched in the following June as a charity chaired by Alex McDiarmid. With many projects being established around this time for three years, four years, and so on, the title Quinco was chosen to indicate that it would continue for at least five years. However, its quaint name was dropped almost immediately, and the campaign thrived after 2002 (later being absorbed into the activities of the Engineering and Technology Board (ETB), one of the successor parts of the EngC, as we shall explain in Chapter 7). The expertise of Quinco's original trustees ranged from that of Board Director of a large British company to that of Secretary of an Engineering Institution. Quinco's aim was "To ensure that engineering made the fullest possible contribution to the nation's wealth and quality of life". Alex McDiarmid was a highly successful Director of Engineering and Operations Director in the public and private sectors within the energy industry; he had also been President of the Institution of Gas

Engineers from April 1995 to March 1996. On his appointment as Quinco Chairman, he declared "During the past three to four years we have seen renewed interest in engineering, thanks to a number of awareness initiatives. But changes to deep-rooted perceptions take time. We need to address a number of groups – young people whom we need to attract into engineering; parents, teachers and career advisers who influence those young people; industry, which has the ability to demonstrate the best of engineering, and engineers themselves who act as role models. And, of course, the media have a key role in all of this." A newsletter was first published in December 1998 to publicise the Campaign's activities and appeared at regular intervals thereafter.

Against these positive public relations activities has to be set a comment by John Lyons, one of the original EngC Council members, and typical of some other comments received:

"I read the *Independent*, *Guardian*, and *The Times* every day, and at least two of the Sunday heavies, and always see one news programme (Channel 4 or BBC) every day, plus Newsnight two or three times a week (i.e., I am a bit of a news junkie). I rarely see engineering or engineers even mentioned, let alone featured. I cannot recall seeing a headline about the Engineering Council itself in the main news pages for years. And what is not in the heavies certainly will not be in the *Sun* etc. I cannot help but say that there is no meaningful national coverage about engineers or engineering even in 2000 AD, which suggests that the Council still has to get out of the starting blocks in this vital area of publicity."

And this from Bernard Dawkins a former EngC Executive:

"Current communications with members (i.e., Registrants) and with its pensioners are inadequate. *Engineering First* is an unwieldy and market-oriented publication. The Engineering Council *Bulletin* is a more succinct and informed publication, but is not issued to Registrants. The communication through the media to the public is very limited. In many networks in which I am active few people know of the Engineering Council. More impact with the public and with engineers, through the media, for instance the TV, Press and internet, is needed."

Environmental Matters

During the period from 1996 to 1998 the EngC took a more active approach to environmental matters, attending the 1996 Environment Exhibition (ET96) in Birmingham and repeating its attendance twelve months later at ET97.

The Environment Award for Engineers, recognising the contribution of UK engineers to safeguarding and improving the environment, was sponsored in 1996 by Lloyd's Register, British Telecommunications, British Aerospace and the IEE. There was an increased number of entries. Four engineers from Normalair-Garrett, Yeovil won the prize, presented by leading environmentalist Sir Crispin Ticknell, Warden of Green College, Oxford. From 1997 winners were eligible to enter the European Business Environmental Awards for Industry together with winners of the Queen's Award for the Environment.

In 1997 the Environment Award, sponsored by Lloyd's Register, British Aerospace, BP, CIBSE and the IEE, was won in October by a three-engineer team from Conoco (UK) for the successful removal and disposal of four off-shore gas platforms in the North Sea. The team received £5,000 and the trophy presented by Rt Hon John Gummer MP. Two new prizes

were awarded in this year – the 'Built Environment Award', run for the EngC by CIBSE, was won by a team from Hereford & Worcester County Council; the 'Best Practice in Environment Management Award', was won by Ian Coutts from ABS Power Generation for his work at South Humberside Power Station.

The 1998 Environment Award for Engineers of £5,000, sponsored by Lloyd's Register, Foster Wheeler Energy, CIBSE, UKAPE and the EngC was again a success. It was presented by Prof Sir Robert May, Government Chief Scientist, to a four-man team from BIP, a West Midlands plastics manufacturer. From 1999 a revised structure was introduced with new awards: in the natural environment, the built environment and for sustainable engineering, open to all engineers who were members of Engineering Institutions.

The state of the Fairclough Initiative at this time

As we saw in Chapter 5 the Fairclough proposals were adopted in December 1995. Perceptions after the first two years of the Fairclough Initiative may be summarised by the following impressions given by Senators and a Director:

Senator Brian Kent:

"With hindsight, I have one over-riding view which affects almost everything within the environment called the EngC and whilst Sir William Barlow said this many, many years ago, I find it worryingly still true and very much responsible for many frustrations which have inhibited the direction and influence of the EngC.

"When I looked at the four Institutions Presidents who finalised the negotiations with Sir John Fairclough for the shape of the new Engineering Council, it was clear that subsequently, when they were no longer Presidents of their Institutions, the messages and actions from "their" Institutions were very different than at the time of negotiation and agreement.

"It seemed to me that the President of an Institution did not necessarily speak at all for the deep held views of his Institution, and many of his speeches were personal and were certainly not supported by a large majority of his membership, and this was been particularly true latterly within the Institution of Civil Engineers.

"We, therefore, had a very odd situation where agreements to proceed within the general "environment of engineering" were made by specific individuals who held their post as President for one year and were by no means followed up and supported by their particular Institutions shaping the detail where, as Sir John Fairclough said, "the devil lies".

"Furthermore, the top-down Government responsibility via the DTI was also similarly dependent upon particularly transient ministers and civil servants and, therefore, when an agreement was made between everybody concerned, it was strange that the people who made it did not necessarily have to carry it out in the spirit in which it was conceived.

"It was also clear to me that the role of construction in the UK was heavily influenced by that of British Consultants (especially in an academic sense) and had very little in common with the whole area of manufacturing which was always at the heart of mechanical electrical engineering".

Senator Ken Burrage:

"So far as the unification project was concerned my personal aims were achieved in that I wished to help create the framework where the whole engineering profession could work together, speak with one voice and act together. I believe we achieved an appropriate framework although the extent to which it was used to drive the profession forward to become more visible, more vigorous and more unified, was perhaps debatable and somewhat of a disappointment to me. The main difficulty in this work was of course the suspicion and vested interests of the Institutions, in particular the "big four". The crucial turning point came with the winning over of the then IEE President, Alan Rudge, to the cause and his success in hammering out the compromise that the other big Institutions would accept. In my opinion most, if not all, of the fears expressed at the time by the Institutions concerning the loss of their power, status, identity or control, although understandable, were unfounded. I suspect that most of the ill feeling that existed at that time was more to do with the way in which the EngC had originally come into being and the personalities of the individuals involved than it was based on any rational thinking".

Senator Les Mercer:

"The recent changes appear to give a better balance. We must involve the Institutions but not let them gain free access to the running of the EngC. If we go too far in this direction, we will follow the sorry paths of the PEIs. Senate is necessary but it is rather ponderous. Meetings should perhaps be extended into the afternoon to allow more open debate on issues of the time. Consider inviting Chief Executives (Secretaries) and Presidents of major Institutions, one Institution at a time, to Senate and ask them to present their approach to running, and making more effective, the Partnership".

BER Director Andrew Ramsay:

"I hope it will be possible (in the Chronicle) to describe the processes which led to reform of the Engineering Council in 1996. The model developed achieved consensus support, and incorporated ideas from the Construction Industry Council, as well as balancing political desires to 'unify' the profession with the understandable independence held dear by long-established engineering Institutions. Unfortunately, the crucial new development - the Board for the Engineering Profession, which should have been a force for integration and sharing of ideas and opportunities within the profession – was not properly understood by its first members, or indeed by the newly-appointed Director General and the Director for the Engineering Profession. It needs much greater buy-in from Institutions in order to succeed in capturing jointly-agreed projects and identifying common public relations issues".

A Director General's Retrospective View

Mike Heath, who had taken over from Denis Filer on 1 June 1995 as Director General, was well aware of the EngC's background and the processes begun by Sir John Fairclough that were taking place. However, he states that he was not made aware of the deep remaining disagreements between the engineering Institutions concerning unification and the future role of the EngC. He was also unaware of their suspicions that a hidden agenda remained to amalgamate them.

Mike Heath believed that his job was to transform the understanding in Britain of the role of engineers in Society, leading to a position alongside other professionals such as doctors and lawyers. He wanted the status of engineers in Britain to match that in countries such as the USA, Germany, France and Japan. He also wanted to ensure that Britain was at least a match for the other major economies in the world in terms of the standards set and enforced for the profession.

Despite such lofty ideals, Mike Heath's first major challenge was his belief that the finances of the EngC were in a dire state, heading for a £1M deficit in 1996 and more thereafter. Faced with uncomfortable realities, the Council did later agree a small fee increase for 1997, ostensibly to enable the new edition or SARTOR to be promoted after it was published.

Later in mid-2000 Mike Heath expressed in retrospect: "It rapidly became clear to me that the Engineering Council had to get its message across to a number of constituencies.

"I believe that relations with Government took a very substantial step forward during my period in office. My first visit to the DTI was a very depressing affair with officials explaining to me kindly but firmly that they took no notice of the engineering profession. Whatever they were told by one body was immediately countermanded by another and the net effect was self-cancelling. Michael Heseltine, President of the Board of Trade, had publicly made scathing remarks to that effect. While concerned about engineering, the Government had chosen to set up its own initiative, Action for Engineering, which largely bypassed the EngC and the Institutions but, in the event, had little impact.

"I explained to DTI officials that we had just concluded a 'peace treaty' and that Unification would change our approach. This was greeted with sceptical laughter and the comment that nothing would ever change. Two years later, however, we had concluded the Memorandum of Understanding with Government [Annex G], we had attracted Government financial backing for a number of schemes, we had an MP on our Council, we were giving regular monthly briefings to the six engineer MPs in the House of Commons and had found routes to make contributions routinely to ministerial speeches. We were often in and out of the offices of Ministers and senior officials and attended political party conferences. The general atmosphere in dealings with Government, especially our sponsor department, the DTI, was transformed.

"Sadly, the major Institutions did not have a positive view of this success. They said that it had the effect of starving them of ministerial contact. Attempts to include them in Engineering Council contacts raised feelings of condescension and stimulated inter-Institutional rivalry.

"Also efforts to attract the interest of engineering companies were not entirely successful. We re-thought our strategy and brought in marketing expertise but, so far from our new 'unity' attracting companies, they seemed to feel that the Profession had become more inwardly obsessed, and perhaps they were partly right. Unification certainly was mightily absorptive of our limited resource. Moreover, Institutions tended to compete rather than co-operate in their efforts to secure financial backing from industry.

"What still baffles me is the seeming aversion of engineering companies to free publicity. We made it our business to cultivate the producers of TV programmes such as Horizon, QED and Tomorrow's World that featured engineering. We found them extremely receptive and indeed

very concerned about the difficulty they had in finding suitable material for their programmes. They were more than eager to accept our offer to be a broker with engineering companies. So without further ado, we approached numbers of our Industry Affiliates and offered them TV coverage for their products. At chief executive level, this was invariably greeted with enormous enthusiasm and fervent promises of early contacts with lots of high-grade material. I have to say, however, that in not one case did a company actually provide anything for us to offer to any TV programme. Eventually we had to taper off our contacts with the producers because of the embarrassment of being unable to deliver.

"The response to the "unification" exercise from Registrants (I believe to be a much-resented term) was mixed. Many approved but others were Institution haters and felt that we had been fatally compromised by the concessions made to the Institutions. In response we revamped our *Newsletter*, and produced a new journal called *Engineering First* which I am sure was a major improvement in our effort to keep Registrants in the picture and seek their views.

"An important way in which we sought information from Registrants was the two-yearly, but eventually annual, salary survey. This proved that Registered Engineers were, on average, well paid and on a par with their other professional colleagues. It was excellent propaganda in the cause of persuading young people that engineering was a worthwhile profession. Some major Institutions, however, objected to the message on the grounds that it was an insult to their lower-paid members.

"Importantly, however, research into young people's attitudes carried out by the Engineering and Marine Training Authority showed that parents had a significantly stronger effect on opinions than teachers. It was, therefore, important to reach out to parents and that, in effect, meant the general public."

On this last point Senator Sir Michael Lickiss agrees:

"I believe the EngC had a unifying effect for the benefit of the engineering profession, but it did not manage to rid parents and the general public of an image of the "oily rag". I know it tried, but the country became desperately short of a whole range of engineers and I suspect that most parents, too, did not encourage their children because of this unfortunate image."

Mike Heath continues:

"My strategy was the use of mass media advertising, using TV in particular. We were in the business of changing public attitudes; a massive task but not impossible as could be seen from the Government campaigns in favour of seat belts and against drinking and driving. We estimated that sums of around £3m per year would be needed so clearly the Engineering Council could not go it alone. Approaches to the major Institutions (the only ones with anything like the resources to make a difference) proved negative. Their view was generally that the proper use of their resources was in servicing their members, not in reaching out to the public. We argued that such a campaign would be entirely in the interests of their members but it cut little ice.

"We, therefore, went elsewhere and found ready partners in the EEF and EMTA. We employed a major advertising and marketing agency (J Walter Thompson) and set about a two-stage campaign. Stage 1 would have been to approach potential sponsors from among engineering companies, showing them potential campaign material, convincing them that it

was in their interests to back us. The Government indicated a willingness to part-fund the campaign and that was the position when I left the EngC. Afterwards the campaign was put on hold for lack of resources but I still feel both that it was essential in the long term and that the EngC needed to give a lead.

"It was interesting to watch the transformation of attitudes of members of the Institution Councils after becoming Engineering Council Senators. Their hostility usually lasted only a few months until they realised both the enormous efforts made by the EngC to accommodate the wishes of the Institutions and the 'no-win' response. Virtually without exception, they radically changed their views but this was of little help as their parent Institutions then saw them as having 'gone native'.

"The Council itself suffered from a number of fundamental weaknesses. Although the election process following the Fairclough Initiative was overtly democratic, most voters had little idea for whom they were voting and the result was that not all members had the appropriate weight. Others who had the required experience and personality were not always prepared to submit themselves to a democratic process. Sadly, too, some who arrived by other routes, e.g. Government nomination, and who had all the qualifications including great achievements in the engineering world, also found it difficult to make much of a contribution. Enormous importance thus fell on the Chairman himself who carried disproportionate weight. I was immensely fortunate during my time as Director-General that the Chairman, Dr Alan Rudge, was never found wanting in providing the leadership, shouldering the burden or displaying the wisdom to find a way through the maze.

"As far as the internal arrangements in the Council are concerned, my view was always that it was well served by dedicated and able staff. Areas such as WISE, the YEB Competition and the Environment Award for Engineers were run on an absolute shoestring and yet produced some of the most excellent events and publicity the Profession ever had.

"The policing of the Profession through the Institution certification and licensing programme was meticulously carried out. Despite it being largely a matter of peer review, there was plenty of scope for mighty Institutions to regard the process as demeaning. Small Institutions on the other hand could have felt threatened by being unreasonably asked for efforts beyond their resources. The EngC nevertheless consistently avoided these twin dangers, much to the credit of the BER staff involved.

"The Engineering Council Examination remained a wonder and an enormous credit to the Council for its high standards and with a tiny staff the consistently successful setting and administration on a worldwide basis.

"The financial reporting and discipline were completely reorganised to operate to the highest commercial standards. The EngC was recognised as an Investor in People and its internal ommunications were revolutionised by a comprehensive and all-embracing intra-net that went a substantial way towards cutting the paper load."

The Fourth Director General

Mike Heath served as Director General until June 1998 and was succeeded by Malcolm Shirley BSc CEng FIMarE who had enjoyed a primarily naval career. He had served as an

officer at sea, as Assistant Naval Attaché at the British Embassy in Paris, at the Ministry of Defence Headquarters in Whitehall, as Assistant Director for the Ministry of Defence in Bath, and had been the UK Military Representative at NATO (SHAPE) Headquarters in Belgium. He was a Member of the Institute of Directors, and from 1996 to 1998 was a Vice President of the Institute of Marine Engineers. At the time of his appointment to the EngC, Malcolm Shirley was Chief Executive and Commanding Officer of HMS Sultan, Europe's largest military training establishment.

Chapter 7 – 1999 to 2001 : The Hawley Years

The Break-up of the EngC

People

The New Chairman

The nomination of Dr Robert Hawley, CBE, BSc, DSc, FRSE, FREng, CEng, FIMechE, FInstP, FIEE, HonDEng, HonDSc, was the only one considered by the EngC's Senate at its meeting of 10 December 1998, held at the IEE. Accordingly, Dr Hawley was adopted as the EngC's sixth and, in effect, final Chairman, a post he held from February 1999 until the end of 2001. He was Chairman of Taylor Woodrow plc, a non-executive Director of Colt Telecom Group plc and of Rutland Trust plc, and Advisory Director to HSBC Bank plc. An engineer and physicist, he had been a power engineer with Parsons NEI and Rolls Royce and had worked with Monty Finniston at IRD in 1961-1964. When the Finniston Report was issued in 1980, he was Managing Director of Parsons. He had served on the IEE Council from 1978, had been Chairman of its Engineering Policy Board, a Junior Vice President in 1984 when the Finniston Report was being debated, and President from October 1996 to September 1997.

As one of his first formal events, Robert Hawley hosted a breakfast meeting in March 1999 with William Hague, Conservative Party Leader, at the EngC offices in Maltravers Street. As the summer approached, Dr Hawley decided that all members of the EngC Senate, most of whom had previously been referred to as Senators, should from 21 May be addressed solely as Senate members and "the use of the word Senator should cease". Whilst this may seem a trivial matter, not a few feathers were ruffled at the time, but more profound changes were to come.

Policy

As we mentioned in Chapter 6, 'The Way Forward' the report of the Activity Review Group, was presented to Senate at Dr Rudge's final meeting on 11 February 1999. 'The Way Forward' broadly recommended that the EngC should reduce costs, generate additional income and increase flexibility to take on new tasks. Naturally this meant re-focussing priorities and introducing changes. The need for this was appreciated and Senate accepted the report and recommended the implementation of 23 changes to the EngC's policies and practices.

At the same time the Strategy document 'Engineering 2005' that had been endorsed by Senate in May 1998 for further consultation and refinement was put on temporary hold.

Immediately, a Strategy Implementation Team, containing members of the major Engineering Institutions and chaired by Professor Tony Ridley, the Chairman of the BEP, was set up to examine the 23 recommendations and propose a way forward. The Team met on eight occasions from March 1999, supported by several working groups. By September the Team had identified and published seven key strategy tasks for urgent attention – implementation of the Activity Review itself, promotion of the Register, task sharing between the EngC and the Institutions, improving partnership with the Institutions, changing the means of election and roles of Senate members (including Senate members acting as *representatives*, not merely

nominees, of their Institutions), analysis of a similar organisation's methods of maintaining a large register and communicating with partner bodies (to compare management styles and costs), and a continuing cooperation and dialogue across the profession to enable the EngC to represent the profession, as appropriate, to Government and other bodies. A synopsis of the seven key tasks of the Activity Review was issued to all Institutions and presented to Senate for endorsement in December 1999. This was regarded as another vehicle for change in the EngC's approach to its Charter responsibilities to regulate and promote the engineering profession.

In effect, the Activity Review Implementation Report identified that the EngC should be more flexible and proactive in responding to customer needs. The Report was saying that the EngC should pass on certain tasks to other organisations, to enable it to move the profession forward more quickly and effectively, in conjunction with the strategy document 'Engineering 2005'. The Director-General Malcolm Shirley summed this is up by stating: "1999 has been an exhausting but very satisfying experience…We now have in place all the elements necessary to achieve the best in promoting and regulating the engineering profession". However, the new Chairman chose to develop a separate agenda, and we shall describe Dr Hawley's subsequent activities below under the initiative that was later to bear his name.

Towards the end of 1999 as a consequence of these activities the EngC published an outline 'Corporate Plan 2000-2002' in the concise form of two A4 pages of text in an attractive cover. One page quoted the "Shared Vision" agreed with the Institutions for the engineering profession; this was followed by the EngC's updated Mission Statement, Strategic Aims and Corporate Commitments, which we reproduce here:

Mission

To maximise the contribution made by the engineering profession to society.

Strategic Aims

- To ensure that the voice for the whole engineering profession is heard and valued.
- To act as a catalyst for Inter-Institution Activities.
- To provide a focus for the agreement of standards for registration in the three categories CEng, IEng and EngTech.
- To compile, maintain and promote the registration of engineers.
- To audit the performance of the Nominated Bodies and major national projects.

Corporate Commitments

- To provide support to UK industry.
- To provide support to the Profession.
- To encourage Excellence.
- To encourage unity of purpose.
- To achieve greater internal efficiency.

The last item, expressing determination to optimize its own performance, was to be achieved by implementing and sustaining the Senate-endorsed findings of the Activity Review and subsequent reviews.

It can be argued that this statement of Aims and Commitments represented only a pale reflection of the MOU with Government [Annex G]. But even if this plan had been adhered to within the existing framework for the EngC, there might have been no need for the break-up that was soon to follow. In the event, after the Activity Review and other major upheavals, as we shall explain later, WISE, Neighbourhood Engineers, Young Engineers for Britain and the EngC Examination were all devolved to other organizations.

Careers Strategy

As a consequence of earlier discussions as to whether the EngC should provide a careers service, a feasibility study was undertaken by the BEP to determine whether a pan-profession service was needed for engineering and technology. Information explaining the aims of the study was sent to the Engineering Institutions, National Training Organisations (NTOs), The Royal Academy of Engineering and the Engineering Employers' Federation.

The Stage 1 report of the feasibility study, which examined and identified the levels of such a pan-profession service, was well received by the many stakeholders and organisations. Work on Stage 2 during 2001 resulted in discussions with other stakeholders for the first ever Pan-Professional Careers Conference planned for February 2002 and organized by the EngC, EMTA, and the National Institute for Careers Education and Counselling.

People

In February 1999 John Battle, Minister of State for Energy and Industry at DTI, in response to an earlier invitation from Alan Rudge, attended a meeting of Senate and announced £1.5m support for the profession over the following three years; much of this was for the Campaign to Promote Engineering (CPE) [see Chapter 6] and the National Marketing Campaign, but conditional upon CPE finding at least 50 patrons and the National Marketing Campaign receiving substantial support from industry. Dr Rudge received the President's Award from the Duke of Kent in 1999 and in the New Year Honours for 2000 he was knighted for services to engineering.

At the end of 1999 15 Senate members (14 of whom had been elected in 1996 and one in 1999) retired; four were the last survivors of the "initial group" who transferred to the new Senate from the "old" EngC Council at the end of 1995. Seven of the Senate were re-elected for a further three years. Two Senate members (Sir Ian Robinson and Prof Bob Boucher) appointed by the Privy Council retired; Sir Michael Lickiss (who had retired at the end of 1998) had still not been replaced. The Privy Council appointed Major General David Judd, formerly of REME, and Lord Puttnam, an Oscar winning film producer and Chairman of the National Endowment for Science, Technology and the Arts and Chairman of the General Teaching Council.

Robin Wilson, Chairman of the Board for Engineers' Regulation, also retired at the end of 1999 having successfully presided over the preparation of SARTOR-3 and many other registration matters. He was succeeded by Professor Patrick Dowling, a Senate member,

Chairman of the EngC Nomination and Audit Committee, past President of the Institution of Structural Engineers and Vice-Chancellor of the University of Surrey.

Professor Tony Ridley, Chairman of the Board for Engineers' Profession also retired at the end of 1999 to be succeeded by its Vice Chairman John Rollo Wood, Managing Director of MIRA, an independent company providing development engineering to the automotive industry worldwide, and a Council Member of RAC Motorsports and of the International Federation of Automotive Engineering. However, in accordance with the Strategy and Activity Review proposals, the Directorate for the Engineering Profession and the Directorate for Marketing and Public Affairs were merged during 2000. New posts of Director of Communications and Marketing and of Deputy Director, Engineers' Promotion, were created. David Worskett was appointed to the former post in April 2000 and Ayaz Siddiqui to the latter in June. David Worskett had occupied a number of civil service positions in various Government Departments after graduating, rising to Director of Road Safety with the Department of the Environment and Transport; immediately prior to joining the EngC he was Public Affairs and Communications Director of the RAC (Royal Automobile Club). Ayaz Siddiqui, a Chartered Engineer with extensive practical experience in the chemical and processing industries, had set up the 'Great Polymer Circus' to attract young people into the materials profession. He moved to the regulatory side of the profession and on his appointment to the EngC he was Membership Services Manager of the Institute of Materials.

A Death in Service

The EngC's Examinations Department suffered a set-back early in 2000 when its Manager, Brian Millicent, died suddenly on 27 January from a heart attack. Brian had been the driving force behind the engineering profession's examinations for over 30 years, having joined the CEI in 1969 and he had moved to the EngC when the CEI examinations were transferred across in 1983. An effective manager of both strategy and detail, he was whole-heartedly committed to his work and had implemented the development of the EngC Examination world-wide.

Interfacing with the Institutions

During this period the Nomination and Audit Committee completed an extensive programme of certification and licensing of Nominated Bodies as well as status reviews on progress in satisfying non-compliance arising from audits, consideration of additional certification and license requirements and examination of routine reports. Revised Regulations were approved for issue to all Institutions in April 2000.

In October 1999 the Institution of Incorporated Executive Engineers joined the Institution of Incorporated Engineers in Electronic, Electrical and Mechanical Engineering. The Institution of Plant Engineers and the Institute of Road Transport Engineers merged on 1 September 2000 under the new name of the Society of Operations Engineers.

During 1999, thanks to the efforts of Terry Smith, the EngC's Senior Executive, Membership, the status of Professional Affiliate attracted, on 28 January, the Safety and Reliability Society, founded in 1980, and on 28 October the Institution of Royal Engineers, established in 1875, and the Institution of Automotive Engineer Assessors, founded in 1932. On 28 October 1999, the Institute of Quality Assurance transferred from being a Nominated Body to that of a Professional Affiliate.

On 25 January 2000 the Association for Project Management linked with the EngC to become a Professional Affiliate and the Institute of Asphalt Technology, founded in 1966, achieved the same status on 12 April 2000 bringing the number of Professional Affiliates to eight. At this time there were 35 Nominated Bodies and three "conditionally" nominated – the Institution of Railway Signal Engineers, the Society of Environmental Engineers and the Institution of Highways and Transportation. Later in the year the Institute of Mathematics and its Applications ended its bid for Nominated Body status and became a Professional Affiliate on 11 July.

In 2001 the Institute of Concrete Technology, founded in 1972, and the Institute of Refrigeration, founded in 1899, became EngC Professional Affiliates on 25 January. The Society of Engineers, established in 1854, became a Professional Affiliate on 11 July, and on 14 September the Association of Cost Engineers moved from being a Nominated Body to become a Professional Affiliate. The Institute of Corrosion, founded in 1959, joined the ranks on 10 October. By the end of 2001 there were 36 EngC Nominated Bodies and 13 EngC Professional Affiliates.

A marked step forward in 2001 was issuing, on the EngC website by the EngC Membership Department, the Accredited Courses Database. As an interactive link this facility enabled all the Institutions, and the public as well, to access details on accredited academic courses without the need for prolonged enquiries or correspondence.

Interfacing with Registrants: The Register, ECROs, Biennial surveys.

A professional marketing manager was appointed in 1999 and an Institution Steering Group formed to promote registration among employers and appropriately qualified engineers.

The Licensing of Competent Persons Task Group proposals of 1997 gained support during 1999. Engineers with certificates of competence were becoming recognised. In 2001 a chapter on Licensing of Competent Persons was added to the Nomination and Audit Committee's Policy and Procedures Manual.

Statistics

'Engineers for Britain: The State of the Profession Towards 2000' was published by the EngC in 1999 in the series of annual statistical digests and contained an additional survey of further education in engineering. It highlighted the significant contribution made by professional engineers to technological change and economic growth.

At the end of 1999 there were some 260,000 CEngs, IEngs and EngTechs listed on the EngC Register – a number that had remained more or less constant for several years (see Fig. 3a).

In December 2000 'The State of the Profession 2001', also in the series mentioned above, was published encompassing an even wider range of statistics. As well as updating the time-series for most of the data, this edition contained a fuller survey of secondary education including information on further mathematics, design and technology and chemistry. More information about skill shortages in the profession and more data about the number of engineers in the labour force (whether registered or not) were included. Economic analysis and modelling were used to indicate the significant contribution made by professional engineers and technology to the process of economic growth.

The EngC 2001 'Survey of Professional Engineers' published in the Autumn of 2001 reiterated the positive findings of the previous publications in this series. Engineering for registered engineers continued to be a well-rewarded career, comparing favourably with other professions.

The End of the PEIs

As a consequence of the Host Institutions withdrawing their financial support from the PEIs (see Chapter 6), the PEI Strategic Alliance Committee decided in October 2000 to fund the PEIs only to the end of March 2001. This was a sad termination to the former ECRO scheme that had been run so successfully from the centre by the EngC.

Interfacing with Schools

WISE

In the New Year List for 1999, Mrs Marie-Noëlle Barton, the Manager of WISE, was awarded the MBE. She had been executively responsible for the campaign since its inception.

On 1 February 1999 Lord Sainsbury hosted a reception at the House of Lords for representatives from 25 companies and organisations to encourage further large companies to become 'Investors in WISE'. During the year WISE in Scotland (that had been launched in 1996) chose as its Second Convenor Jane Watson, a development engineer with Marconi Electronics Systems in Edinburgh. WISE in Northern Ireland chose as its Chairman a scientist, Dr Deirdre Griffith working in the Industrial Research and Technology Unit of the Department of Economic Development.

WISE Moves

One of the outcomes of the 'Activity Review' was the decision for WISE to become a joint project of the EngC, EMTA and EEF, "the engineering community's three principal representative bodies". As a consequence the EngC's WISE team of three left the EngC Maltravers Street offices in December 1999 to move to EMTA's headquarters in Queen Anne's Gate, London. The line management of WISE transferred to EMTA on 1 January 2000.

The WISE campaign was then re-launched in April 2000 with the Rt Hon Margaret Beckett as guest of honour. A competition aimed at young people under the age of 18 was initiated to generate ideas for the replacement of the WISE buses. The EngC continued to support WISE under its new management throughout 2000 and 2001.

Neighbourhood Engineers Programme (NEP)

In contrast to the PEIs and the WISE scheme, the Neighbourhood Engineers Programme now under the executive direction of Don Bootle, with over 8,500 engineers and technicians in some 2,500 schools, was initially retained within the EngC, and continued to flourish during 1999. The scheme was managed and administered through partnerships, chiefly with Science and Technology Regional Organisations (SATROs) and Education Business Partnerships (EBPs). These already managed school and industry schemes such as the Engineering Education Scheme (EES), Industry Projects - Understanding Technology (INPUT), Creativity

in Science and Technology (CREST) projects, and Young Engineers' Clubs. The Junior Engineers for Britain competition enabled the Neighbourhood Engineers programme to more than double the number of primary schools with which it was involved.

The Neighbourhood Engineer Programme Managers held a conference at Heriot Watt University, Edinburgh in October 1999 to discuss issues, share ideas and promote best practice.

At its October 2000 meeting the BEP accepted the Brookbridge Report measuring the impact and efficiency of the NEP. A programme of improvement to the management of the programme was unanimously agreed. The NEP central management team took delivery of new communications material to assist local NEP managers in promoting the scheme to schools, engineers and employers.

Two major NEP conferences were held during 2000 in Wakefield and Bournemouth covering topics such as the Headstart Programme, Data Protection/Child Protection Regulations and the implication for the NEP of the new Learning and Skills Councils.

Then in 2001, in line with the strategy of the new Engineering and Technology Board (ETB) – see later in this Chapter – management of the NEP was transferred to SETNET as part of the overall Science and Engineering Ambassadors' initiative which SETNET had been asked to manage by the DTI.

Young Engineers for Britain

Over 1,400 young people aged 7 to 25 years entered models, projects and inventions for the 2000 YEB competition. The National final held at the Millennium Dome in London was a prestigious showcase for their talent, ingenuity and achievement. The title 'Young Engineer for Britain 2000' was won by Louise Elliott (17) from St Aidan's and St John Fisher Associated Sixth Form College with her project 'THE BUG', a highly manoeuverable outdoor buggy for a disabled child. The winners of the 'Junior Engineers for Britain Challenge' were Jordan Dobbie (10) and Susan Johnstone (11), both from Beith Primary School, who constructed a solar powered robot. The winners received their awards from HRH The Duke of Kent. The year 2000 competition was generously sponsored by many companies and received extensive media coverage on television, radio and the national press, in addition to specialist and Institution publications.

The 2001 National Final was held on 10-12 September at the Business Design Centre, Islington with a top prize of £5,000 going to the winners Brendan Quinn and Edna Young from St Patrick's College, Maghers for their winning idea 'Self Sustained Induction Deferrer' (SID). This was an automatic pod to scare away birds sitting on power lines, using power from the line to propel the pod along the cable.

In line with the strategy developed for the forthcoming ETB (see later in this Chapter), responsibility for the YEB programme was transferred from the EngC to another organization, 'Young Engineers' (YE), with effect from 1 January 2002. YE ran the 'Young Engineers Clubs' and was set to manage the YEB and JEB events for 2002 onward.

Other Schools Activities

In May 1999 the Schools' Institution Working Group (SIWG), chaired by Dorrie Giles of the IEE, held its final meeting concluding nine months' work. The SIWG comprised representatives from 16 Institutions, the Royal Academy of Engineering and SETNET. In July 1999 the Group's Report, outlining a way forward regarding volunteer activity in the regions, was approved by Senate for implementation.

Shortages of teachers of science and of design and technology were highlighted in 1999 in an EngC-led response to the Government's Green Paper 'Teachers: Meeting the Challenge of Change', which led to discussions with the DfEE and the Teacher Training Agency.

During 1999 the General Education Committee (GEC), chaired by Professor Tom Ruxton, Dean of the School of Engineering and Advanced Technology at Staffordshire University, looked at life-long education and training. Helped by a GEC and Wider Group drawn from individuals in the education field, the Committee considered how to further public understanding of engineering and technology and the formation of engineers.

In September 2000 the GEC and Wider Group was reformed as a joint BER/BEP effort. This sparked a wide-ranging series of Seminar and Research projects held in conjunction with the Qualifications and Curriculum Authority (QCA), the first addressing a Design and Technology curriculum development theme. The event was oversubscribed. David Hargreaves, Chief Executive of the QCA opened the proceedings and two research projects were presented. The first, 'Continuum of Engineering Education', was presented by Professor Geoffrey Harrison, and the second, 'Interaction: Links between Science and Design and Technology in the Secondary Curriculum', was presented by Dr David Barlex and James Pitt. Stemming from this a number of key organisations agreed to fund a pilot study aimed at improving collaboration in the teaching of secondary level science and design and technology. A joint project was established with the Royal Society of Arts and the Technology Education Research Unit, of Goldsmiths' College to develop an assessment model to recognise competence in secondary level education

The second seminar held at the QCA on 12 December 2000 was entitled 'Progression in Mathematics', again with high participation from many bodies and organisations and with authoritative speakers from the mathematics community.

In 2000/2001 the profession was represented by the EngC on a range of steering groups including 'GCSE in Engineering' a Design and Technology Strategy Group (hosted by the DfES) and Electronics in Schools (hosted by the DTI).

Further and Higher Education

The appointment in 1999 of Richard Shearman (formerly Education Director at the Design Council) as Vocational Education and Training Executive, in succession to Dr Judith Secker, provided an opportunity for a number of key issues in this field to be reviewed. During the year the Registration Standards Committee (RSC), chaired by Martin Usher and reporting to the BER, set up several short-life task groups to consider the remaining aspects of the Formation process. This resulted in further SARTOR-3 documents being published in July 1999 to expand on various requirements; the publications included guidance for Institutions on Matching Sections, Group Projects, Initial Professional Development and Professional

Review Interviews. SARTOR-3 was fully implemented in the Autumn of 1999, effectively raising the education and training standards for those entering the profession [see Chapters 5 and 6]. Arrangements were established for a transition process to take care of those candidates who had started under the former SARTOR-2 rules.

Also in 1999 the RSC defined standards for those pursuing non-mainstream routes to CEng and IEng, including the Individual Case Procedure and the Mature Candidate Route. For Engineering Technicians, progress was made during the year with the Qualifications and Curriculum Authority (QCA) towards recognising EngTech as a qualification meriting publicly-funded education.

In 2000 the RSC continued to develop SARTOR-3. Two proposals concerned with alternative routes to Registration were approved. The first was for very senior engineers working in organisations at or near Board level whose educational qualifications would not satisfy current SARTOR requirements. The second proposal concerned a route to professional review for suitable mature candidates through a process of career appraisal rather than the existing Mature Candidate route. Pilot trials of these routes were not regarded as successful initially. In 2001 a *Pathways to Registration Handbook* was published dealing with common procedures and replacing several other documents. Another publication was *Standards for Professional Engineers : A Guide for Employers* explaining SARTOR standards and the background to them.

The BER contributed to EDEXCEL's reviews of higher NVQ and GNVQ syllabi and also to developing a new matching section for IEng to enable those with NVQs to move towards registration with the EngC. In addition, the BER responded in 1999 to several Government education-related initiatives, including the Green Paper 'Learning to Succeed' which examined the funding and inspection regime in the FE sector. An EngC-sponsored seminar issued a joint response to this.

At the Higher Education level the EngC represented the profession on a number of QAA/Engineering Professors' Council working groups looking at compatibility of benchmark statements for engineering degrees. The EngC also convened a joint Institutions' Working Group to develop the QAA's engineering benchmark for MEng degrees.

EngC Examinations

The year 2000 was a difficult one for the examinations team due to the untimely death, already mentioned, of their Manager, Brian Millicent. However the appointment of Chris Harrison as his successor facilitated a review of key issues and a radical overhaul of the examination. New web-based information was developed to considerably improve marketing of the EngC Examinations, especially overseas where most candidates resided. As part of the overhaul, almost all of the Part 2 syllabuses were revised and the reading list of some 400 titles brought up-to-date. This was disseminated overseas by the British Council. A new scheme was devised for the approval of EngC Examination Centres overseas.

From 2000 success in the Part 1 Examination was rewarded with an EngC Certificate, success in Part 2 with a Diploma and success in the new Part 3 with an Advanced Diploma. Options for the delivery of teaching materials via the internet to overseas candidates were investigated and possible strategic alliances for enhanced examination marketing were evaluated.

A major change came about in December 2001 when, as part of the drive for greater efficiency, the decision was taken, after extensive negotiation, to transfer the administration of the EngC examination to the City and Guilds of London Institute. The EngC, however, through its Examinations Committee, retained full responsibility for the standards and content of the examination.

Interfacing Internationally

The EngC's International Committee, with considerable assistance from the DTI, devised a new certificate for Incorporated Engineers who wished to be recognised in Continental Europe, but this Committee still encouraged Institutions to nominate members to the EurEta (European Engineering Technician) Register operated by the European Federation of Engineering Institutions (FEANI).

However, at FEANI there were some administrative problems as the Secretary General had been dismissed at the beginning of 1999 and the President, Sir John Cullen, originally a UK nominee, resigned. However, at a meeting of the FEANI Presidents in June, to help stabilise the situation, Professor Ernest Shannon was appointed to the FEANI Executive and Andrew Ramsay, the EngC's Director – Engineers' Regulation, was elected to FEANI's team of three internal auditors.

David Rogers who had experienced a long involvement with the BER and with international equivalences wrote in 2000:

"The EngC contribution to FEANI has strengthened. We continue to be represented on the European Monitoring Committee. We are beginning to make progress in getting FEANI to recognise within the EURING 2000 document the necessity to demonstrate the added value of Eur Ing by evaluation of Professional Development and the advantages of a Professional Review. The EngC has built on its representative status for the UK in the Washington Accord by playing a leading role in developing it to become the Engineers' Mobility Forum, with Robin Wilson, a former BER Chairman, as its new Chairman. The recent meeting in Vancouver, with Matthew Dixon representing EngC while I represented FEANI, made good progress on a revised Agreement and Memorandum of Understanding. If we can get confirmation by the signatory countries, there is a good chance of getting an International Register in place by 2001.

"The equivalent process for IEng is following on behind, but may be a bit more difficult because of the lack of understanding of the differing titles of practical engineers and 'technicians' throughout Europe. International agreements certainly demand a great deal of patience."

In 2000 the International Committee was replaced by an 'International Advisory Committee' comprising Senate Members active in international affairs and key international representatives of the profession.

Demand for international activities was increasing. Over the previous three years the EngC had been negotiating a Trilateral Agreement to ease recognition by Italy and France of CEng and IEng Registrants. This resulted in a formal agreement signed in Paris on 18 December 2000. Also on the European front, an IEng certificate was developed in conjunction with the

DTI and the Nominated Bodies for those IEngs wishing to work, or already working, in Europe.

After the crises in FEANI of 1999, there were many satisfactory outcomes at the FEANI General Assembly held in Hamburg in October 2000. Progress made on revising the constitution gave grounds for believing that FEANI would become the pro-active, pan-European umbrella body the profession needed. Revision to EurIng guidance would allow some, if not all IEngs entry to the FEANI Register. The European Commission continued to cite the EurIng system (originally conceived in 1986, it will be recalled, by the EngC with FEANI) as a successful example of European inter-professional agreement.

During 2001 FEANI carried out a survey of employers' approaches to CPD and the EngC represented the UK engineering profession at the FEANI CPD seminar in Luxembourg.

In contacts outside Europe, links with the World Federation of Engineering Organisations (WFEO) were severed by the EngC in 1999 as a consequence of the 'Activity Review'- though it has to be observed that such a change sits uncomfortably with the stated responsibility of the BER (Chapter 5) to 'represent the engineering profession on matters which relate to the international recognition of UK engineering qualifications'. Also during that year the responsibility for the Commonwealth Engineers' Council was transferred to the BEP.

However, work continued in 2000 and 2001 on the detailed implementation of a number of recently signed or updated agreements to help UK Engineers to practice overseas. Meetings of the previously described 'Washington Accord', 'Sydney Accord', 'Engineers Mobility Forum' and also the 'Engineering Technologists Forum' were held in South Africa.

Interfacing with Industry

The Industry Affiliates

The continuing efforts of the EngC's Executive Clive Coker resulted in the Industry Affiliate Network (IAN) numbering 110 organisations by the end of 1999. The Industry Affiliate Club held 8 meetings, and at an IA forum on 'You, Your Company and the Law' in June 1999 a key speaker was Michael Wills, Parliamentary Under Secretary of State for Small Firms. At another forum in December Lord Sainsbury spoke on 'Innovation Management: People, Ideas and Finance for Success', reviewing the movement of ideas to the commercial market.

Also as part of the Industry Affiliates activities the broadly-based *ENVOX* newsletters were issued electronically to members. The title was chosen, with a smattering of Latin, to subtly indicate 'Engineering Voice', reflecting the EngC's claim to be 'The Voice of the Engineering Profession'. One series of newsletters, *ENVOX(t)*, was directed to those with an interest in new technology, technology transfer and innovation. The other, *ENVOX(p)* served the interests of Human Resources and Public Relations people in companies underpinned by engineering and technology.

In 2000 representatives from eight Industry Affiliate companies, including BNFL, ICL and Anglian Water, participated in a DTI supported but EngC led 'E-Business' mission to the United States of America. The primary aim was to learn from leading US exponents of E-Business about the exploitation of internet technologies. Companies that the representatives

visited included Lucent-Bell Laboratories and the Ford Motor Company. The findings of the Mission were disseminated and the Mission report was launched at an E-Business Forum held on 7 December at the CBI Conference Centre in London.

In September 2000 the EngC Innovation Special Interest Group met at Imperial College and at Oxford University to hear about technology based spin-off companies formed as a result of research activities.

'Disputes – Risks and Resolutions' was the topic of an Industry Affiliates' Club meeting held in October 2000 at the offices of Lloyd's Register of Shipping. Mark Alcock of BAE Systems was the keynote speaker while the UK law firm, Hammond Suddards Edge, provided sponsorship and additional input.

During 2001 the Industry Affiliate Network produced a number of 'Innovation Exchange' one-day conferences with themes such as energy and materials, communications and construction. The IAN was then modified as part of the policy of one of the EngC's successor bodies, the Engineering and Technology Board (ETB), to incorporate 'ETB Network Members' and so cater for the wider interests of both industry and business partners.

Interfacing with the Public

Publications, Press, National issues (environment etc)

An EngC Conference was held at the Royal Society of Arts in April 1999, attended by MPs, industrialists and engineers; this was opened by Stephen Byers, Secretary of State for Trade and Industry who, in the key-note speech, spoke on the important role that engineers had to play in improving the competitiveness of the UK and its economy.

The 5-year Marketing Campaign embodied within the 'Engineering 2005' strategy document mentioned previously was postponed in 1999 through a lack of financial support. This was to have been a joint enterprise of the Engineering Marketing Group (EMG), comprising the EngC, EEF, EMTA and the Engineering Construction Industry Training Board (ECITB), to change the national perception of engineering, and attract youngsters into engineering. £3-5m annually was deemed necessary for a successful campaign and while EMG committed £1m and DTI offered "significant" financial support, subject to industry also contributing significantly, unfortunately Industry did not respond, the economic climate and many millennium-related projects having diverted attention elsewhere.

However, the EngC's own marketing capability was strengthened during 1999 by restructuring and re-staffing the marketing and public affairs functions and setting up a new Directorate of Marketing and Public Affairs (DMPA) in the summer. Brian O'Neill, the Public Affairs Director in post at the time, headed the new DMPA and it was intended to promote a more commercially focussed culture throughout the EngC. This reorganisation was said to have saved over £100,000 annually and enabled registration fees to be frozen for the year 2000.

Engineering First, the EngC's newspaper that had been sent to all Registrants twice a year since February 1998, appeared in the following February with a greater number of pages (12) and with the innovative addition of advertisements for products and services of benefit to professional engineers and technicians. In August 2000 *Engineering First* was published in a

new A4 format, developed as a result of seeking the views of Registrants. In it the EngC Chairman, Dr Hawley highlighted issues facing the profession and backed the SARTOR approach to improving quality and maintaining standards

Environment Award for Engineers

The highly successful Environment Award for Engineers was re-launched in 1999 with a new structure having three additional categories to reflect topical concerns. The categories were 'Engineering in the Natural Environment', 'Engineering in the Built Environment' and 'Sustainable Engineering'. The sponsors were Lloyd's Register, Rolls Royce, British Energy, UKAPE and the EngC. The 1999 Award for Engineers was won by a 5-man team from TWI for a new aluminium welding technique who received the Lloyd's Register Trophy and £5,000. The British Energy 'Award for Sustainable Engineering' was won jointly by TWI and Serck Heat Transfer Ltd. The Rolls Royce 'Engineering in the Natural Environment Award' was won by RKL-Avp and Yorkshire Water. The 'Engineering in the Built Environment Award' was won by NatWest Group Property.

In the following year the Awards Ceremony took place at the Science Museum on 10 October with nearly 300 guests attending. The overall winners for 2000 were from Morrison Construction Ltd who received the 'Lloyd's Register Trophy'. They also received the 'Rolls-Royce Award for Engineering in the Natural Environment'. The winners of the 'British Energy Award for Sustainable Development' were Mitsui Babcock. A new class, 'Engineering Alternatives', was won by Shetland Heat Energy and Power Ltd.

The final EngC Awards Ceremony took place at the Institution of Civil Engineers on 10 October 2001. The destiny of this successful venture would now reside in the hands of the future ETB with other stakeholders managing the Award in the future.

Recognising Excellence Campaign

Work began during 1999 on the 'Recognising Excellence' campaign, launched in the following year at Peterborough in conjunction with marketing the Register, to encourage companies to employ registered engineers and Institution members. Evaluation of the initial launch was completed in 2000 but awaited additional feedback from the opening phases of the wider East Anglian pilot. Generally, responses to the campaign messages and materials were pleasing but, as expected, it was clear that some adjustment had to be made before rolling the campaign out elsewhere.

The second phase of the regional campaign programme was launched in Newport South Wales in March 2001 by James Dyson. A publicity event for 'Recognising Excellence' took place in Bristol in October of that year and received good media coverage.

The Hawley Initiative

When Robert Hawley became Chairman of the EngC in February 1999 in succession to Alan Rudge, the 'Lasting New Relationship' which was the outcome of the Fairclough Initiative [see Chapter 5] was still bedding in. The consequent 'Activity Review' that we have mentioned above, was well under way but the recommended changes had not been set fully in place. The new Director General of the EngC, Malcolm Shirley, had been in post only a matter of months – he had joined in June 1998 - and was occupied for much of his time with

the cultivation of mutual trust, understanding and working relationships between the EngC and the Institutions, especially the major ones. Fortuitously, seven out of the eight biggest Institutions had recently appointed new Chief Executives, giving an opportunity to sweep away some of the old prejudices and allowing a fresh recognition of the value of working together. Although some progress was made, this was an aspiration not easily fulfilled.

Dr Hawley said that, not to his great surprise, he found the Institutions were still fragmented in their views with the so-called 'Big Four' (Civil, Mechanical, Electrical and Chemical) trying to control the agenda through having joint meetings with their Presidents and Chief Executives. He felt that the views of the smaller Institutions were equally important, particularly as some were hunting at the edge of technology and indeed might become the big Institutions of the future. He, therefore, set out to hold a series of meetings with eight presidents at a time to determine their views as to what should happen in the future. Dr Hawley found a wide spread of views and also (as had every previous Chairman) that Presidents, who changed every year, were often unaware of activities of the EngC and in any case they had not been briefed by their Chief Executives.

September 1999

At Dr Hawley's first meeting with the DTI's new Minister for Science, Lord Sainsbury of Turville, there was a meeting of minds on the question of the future of the EngC. The Minister proposed a major review of the work of the Council to 'add greater value to the profession'. He may not have been fully aware of some changes already taking place, but he was certainly aware that the 'Memorandum of Understanding' between the EngC and the Government [see Chapter 6] was not being pursued by the EngC with any vigour. He challenged Dr Hawley to identify how the EngC could add value to the 'wider engineering community'. The official report states that Lord Sainsbury "invited Dr Hawley to work with DTI officials to review the contribution the Engineering Council should make to add value to the engineering community by improving the effectiveness of existing activities in such areas as the promotion and standards of engineering, by building on existing synergies with other organisations".

Dr Hawley, already inclined towards a fundamental rethink of the role of the EngC, took up the challenge. He determined on a path of radical change, as he had followed in other organisations into which he had been invited. The Minister and Dr Hawley decided that a small working party would be established with accepted terms of reference. The key was for the EngC to change from representing the *profession* to representing the *community* (as originally agreed in the neglected 1997 Memorandum of Understanding) a reminder for which Dr Hawley gave the credit to Lord Sainsbury.

The composition of the Working Group was:

Dr Robert Hawley (Chairman)	EngC (Chairman)
Robert Foster	DTI
Tony Kesten	DTI
Iain Sturrock	EngC (Member of Senate)
Malcolm Shirley	EngC (Director General)

The Hawley Group, as it came to be known, met for the first time at the end of October 1999 and held eight further meetings.

On 24 September 1999 the DTI circulated a memo to other governmental interests notifying of the DTI/EngC review of the EngC. The reactions to this revealed that even at this early stage there were reservations being expressed about this initiative. For example, on 29 September 1999 Dr John Taylor of the Office of Science and Technology and a past President of the IEE wrote (though not formally from the IEE) to Lord Sainsbury:
"In an era of open government I am concerned that this [initiative] is to be launched without consultation with the Institutions…I am concerned about some of the wording in the memo. For example 'the intent is to strengthen its position…develop a strategy for strengthening the position of the EngC in relation to the other engineering Institutions'. For Government to announce such a policy without even telling the Institutions is surely going to be counterproductive to getting more coherence – would you similarly undermine the Institute of Chemistry, the Institute of Physics? I believe we should meet and discuss these points before the review is launched".

Following this, Dr Hawley met Dr Taylor on more than one occasion for a helpful exchange of views.

Moreover, the news of yet another enquiry was met with scepticism by some staff members at the EngC: "What! *Another* review? *Another* initiative?" Coming after Fairclough, only a few years previously, which heralded the advent of the 'lasting new relationship', with the new Memorandum of Understanding of 1997 hardly addressed, and with the current 'Activity Review' still under way, it is surprising that much stronger comments were not voiced.

However, let us look at it through the eyes of a perceptive observer in hindsight. True, the EngC had a dedicated and hard-working staff responsible for running a number of worthwhile projects including Industry Affiliates, WISE, Neighbourhood Engineers, and the YEB competition. There had been, and still were, many press campaigns, the acceptance of UK engineering qualifications overseas, the EngC Examination and much comment on matters of national concern. But none of these were *recent* initiatives and in some areas, such as public relations, the EngC had gone somewhat downhill. Again, the Fairclough 'new relationship', although containing a worthwhile vision, had stumbled because of an unwieldy Senate of 50+ members. Also the subsequent 'Activity Review' had given an opportunity for those in the Institutions who wanted to pursue their own anti-EngC agendas. It might have been reasonable for WISE to be transferred to EMTA - as previously noted - but the ECROs had been wound up in favour of the disastrous move to create Institution-run PEIs [see Chapter 6]. But principally the provisions of the important 'Memorandum of Understanding' of March 1997 between the Government and the EngC had been allowed to languish. Implementation of the MOU would have immeasurably strengthened the EngC and, as already remarked, this was possibly in Lord Sainsbury's mind when making his request to Dr Hawley. We may also recall from Chapter 4 Sir William Barlow's desire in the late 1980s, foiled by the Institutions, for the EngC to comment regularly on matters of national importance.

From that perspective, a new approach was not only desirable but essential. No organisation can afford to stand still. Without going forward, it will surely slip back. Paradoxically, it seems that the Fairclough Initiative to improve relationships with the Institutions, which occupied so much of the efforts of successive Directors General, caused the wider initiatives embedded in the MOU to be overlooked or neglected.

October – December 1999

The Hawley Working Group's first stage, planned for completion within three months by January 2000, was to agree the strategy objectives for the next three years. The second stage, to be completed by July 2000, would develop a strategy to achieve these objectives.

On 12 November 1999 the DTI issued a press release having arranged a meeting specifically to brief the key players on the purposes of the Hawley Review and to seek their support. But progress was not without difficulties. On 25 November a joint letter was sent to the Minister from the EEF and EMTA after they had met with Dr Hawley at the Minister's request. EEF and EMTA stated that they were happy to co-operate in this Review but "still remained cautious of any move which seeks to establish a single voice for the engineering community or one which might interpose a further rung in the communication chain to Government". But curiously they added their understanding of the Minister's position "that the EngC is not seeking to extend its remit into areas beyond its current areas of competency" when, of course, such an extension was exactly what Dr Hawley was proposing. EEF and EMTA also restated their disappointment (to put it no higher) not to be included in the Hawley Working Group that was confined to EngC and DTI representatives. They specifically wanted an 'industrialist' to be included in the Working Group and when it was pointed out that Dr Hawley was one, the response was "No - he's an academic !". Although Dr Hawley agreed to the suggestion that there could be an 'industrial advisor', in the event nothing came of this.

The initial work of the Hawley Group was presented to, and endorsed by, the EngC Senate on 9 December 1999. At that point it seemed that the Hawley Group's line of thinking dovetailed excellently with what was already going on; indeed, in parallel with implementing the Activity Review, internal restructuring, particularly aimed at more effective promotion and communication of the profession, was proceeding apace. Early in 2000, a new Director of Communications and Marketing, David Worskett, had been appointed to take over the newly combined Directorates of Public Affairs and Promotion. The aim was to give renewed impetus to the EngC's faltering PR effort that had seriously deteriorated since the days of Ron Kirby. This new appointment was intended to allow improvements in the promotion of engineering to proceed alongside the ongoing work towards a more harmonious relationship with the professional Institutions. However, it was perceived that such improvements might not be possible unless there were changes in the governance of the Council itself to give the Institutions - and other elements of the community – a greater sense of ownership of its role and activities

February 2000

The Hawley Stage 1 Report was given to the Minister on 26 January who then held a meeting with the Working Group. The Report was published in February 2000 with Strategic Objectives of:

- Promoting the understanding of Engineering and its contribution to the knowledge based economy and sustainable development.
- Developing communication channels with the engineering community in order to establish commitment to the ultimate goal.
- Encouraging consensus.
- Acting as a forum
- Establishing the competences that engineers need in the knowledge-based economy

To test the validity of the objectives and to aid development of its strategy, the Hawley Group now sought the views of other bodies including EMTA, EEF, the General Teaching Council and the Engineering Institutions as well as of the EngC's committees. Dr Hawley himself held many meetings with organisations and individuals. One of the key events was a speech at the City and Guilds Association Annual Dinner on 17 February 2000 in which he put forward a vision of the future shape of engineering and industry. "..the UK will develop a culture…which approves of wealth creation, encourages innovation and entrepreneurship and is not jealous of success". He pointed out that although engineering officially contributed but 8% of GDP, if 'engineering-led' industries such as construction, electronics and telecommunications were included, the figure rose to 40%. And if 'engineering dependent industries' such as the financial and retail were added in, that figure virtually doubled.

The intention was for these numerous and wide communications and consultations to 'generate timely consensus views from the wider engineering community' to advise the Government on such issues as:

- The role of engineering in society
- The present and future skills needs of the engineering community and the means to fulfil these needs
- All education issues relevant to engineering
- Knowledge of developments abroad

The Hawley Group offered the following definition of the Engineering Community:

> The engineering community is the sum of all individuals and groups who employ engineering skills and expertise to add value to society or the economy. This is a much broader remit than industry alone because it covers areas such as the financial, medical and arts sectors.

This notion of the 'Broader Engineering Community' was to drive much of the ensuing action. The Hawley Review was based on the premise that the 'engineering community' extended far beyond the commonly recognised boundaries of the profession. In this perception it was, however, fundamentally similar to Fairclough's ideas and the 1997 Memorandum of Understanding with Government

The above objectives certainly fell within the existing remit of the EngC and could have been met by implementing the provisions of the recent MOU with Government, had the will existed to drive forward with them. For example the MOU states at Article 4e "The Engineering Council should …*with other organisations*…define clear routes for advancement of the "*engineering workforce*" [our italics added]. In a sense, the Hawley Review took up the challenge of defining this phrase and one of the next actions was to form a joint Engineering Council / Royal Academy of Engineering (RAEng) working party to:

- Seek a definition of the engineering profession and its practising population.
- Seek to define engineering competencies and how to recognise and promote these.
- Articulate appropriate terminology to define the full scope of engineering and of those who practise it.
- Recommend how to integrate science and engineering for more effective exploitation to the betterment of society and the economy.

This working party was serviced by the Royal Academy of Engineering and consisted of:

Chairman	Sir Robert Malpas FREng
Nominated by the RAEng	Dr David Grant FREng
	Professor Ian Shanks FREng
Nominated by the EngC	Professor Peter Hills CEng
	Professor Tony Ridley FREng

Recognising the efforts of its Chairman, the activities of this Working Party became known as the 'Malpas Enquiry'.

April – June 2000

Turf Wars

The Stage 1 Report of the Hawley Group had been widely circulated and the Project Director Paul Langdell reported that by 12 April 2000 there had been 54 responses from Engineering Council Senate members, the Institutions, academia and employers. Many were supportive and there were several useful suggestions. But concerns too were raised, principally again from EEF and EMTA that maintained that the planned role for the EngC cut directly across their responsibilities and warned that " the Hawley Group still seems intent on broadening the Engineering Council's role beyond that which it has the expertise and resource to undertake successfully." Concern was also expressed by some Institutions and by the Royal Academy of Engineering that the Hawley Group proposals might conflict with their activities and communications with Government. Everyone, it seemed, was defending their own turf although the contributions from industry were free from this and were generally supportive, especially on the question of the broader engineering community.

In the Spring and Summer of 2000 there were further interactive sessions of the Hawley Group. Briefing meetings were held with EngC Senate members, Engineering Institutions and engineering leaders. On 23 May 2000 Lord Sainsbury, with senior DTI officials, called a meeting with representatives of the Engineering Community at the DTI Conference Centre in London at which Dr Hawley made a presentation of the progress so far and the emerging strategies for stages two and three of the Review.

Dr Hawley stated that he felt confident of widespread support for the project; he surveyed the strategic objectives [see above] and the challenges facing the initiative, and acknowledged the real practical support of industry and business – particularly that of six companies through the secondment of high calibre project managers. He concluded by pledging continued widespread consultation and assured his listeners that all ideas that came through would be carefully considered.

In the discussion there was considerable encouragement from Institution representatives and industry for the Hawley approach but again there were dissident voices coming from the EEF and EMTA. The former asserted that the EEF had been broadly supportive when a review of the EngC was announced but that there had been a severe case of 'mission creep' and that the Hawley Group was now duplicating work and simply served to exaggerate the divisions within the engineering community. The Group, according to the EEF, could not be representative without the support of the key stakeholders. The EMTA representative also was unable to add support with any enthusiasm, claiming that the Hawley Group had made

no attempt to consider the EMTA response to the consultation exercise. EMTA had a particular problem with the strategic objectives of the Hawley Review that appeared to cut across EMTA's responsibilities as the National Training Organisation recognised by the DfEE to act for the manufacturing sector. EMTA was not prepared to hand over its 'sovereign rights'.

Lord Sainsbury and others deplored assertions of 'sovereignty' and 'turf rights' and emphasised the necessity for the co-operation of all concerned, but EMTA re-asserted its position. Sir Ralph Robins of Rolls Royce, a strong Hawley supporter, said that if the discussion continued in its present vein, he would leave. After further discussion and something of a softening by the EEF and EMTA of their positions, Lord Sainsbury said that while there had been some dissenting voices, there had been considerable support for the Hawley Group concept and for its approach. He re-iterated the importance he attached to the Review and stressed the importance of including everybody in the review process.

On 30 May 2000 the EEF and EMTA again wrote to Lord Sainsbury reminding him that their principal concern was that the EngC was "going off the rails". However, with certain re-assurances that they state were given by the Minister, they agreed to meet Dr Hawley and his team and start to work together towards a shared goal.

The 'Universe of Engineering'

Turning now to the joint working party with the Royal Academy of Engineering (the Malpas Enquiry), the outcome in June 2000 was the publication of a joint report *The Universe of Engineering – A UK Perspective.* The report observed that the role of engineering in society and the economy was not evident to the public or the media. Many including, unfortunately, young people, considered the engineering profession as a somewhat dull, uncreative activity wholly associated with the so-called "old economy". The report sought to illuminate the main issues at the heart of this unsatisfactory situation "…and provided a background for the Hawley Group to identify and deal with these issues".

The report's main conclusion was that the 'Universe of Engineering' was much larger than generally supposed. Its size and range could have been gauged from the following facts:

- At least half of the 1,500 companies (other than purely financial) quoted daily in the *Financial Times* depended on engineering to be competitive, and so survive and prosper.
- One or more, in some cases all, of the engineering disciplines were involved to a significant degree in eleven substantial 'application fields' that categorised the economy. These were: Healthcare and Social / Leisure and Entertainment / Education / Commerce, Trade and Finance / Communications and IT / Defence and Security / Transport / Agriculture and Food / Engineered Materials / Energy and Natural Resources /Built Environment.
- The so-called "New Economy" had been created and continued to be created through the process of engineering.
- Economists had added *technology* to the traditional three prime inputs to all economic activity, *labour, capital, materials.* It was the engineering process that created technology.

The Malpas Report then went on to estimate that the 'broader engineering community' comprised some 2,000,000 people in the UK. It was believed that three quarters of them had an engineering or similarly equivalent qualification of whom some 570,000 had a technical degree with 290,000 on the EngC Register (including those overseas). It was pointed out – fairly – that there was a conflict within the EngC and the Institutions setting out to be *exclusive*, where they set and maintained standards; and *inclusive*, where they aimed to have wider appeal. This was the point seized upon by the Hawley Group in further developing its ideas on the Engineering Community – the 2 million individuals working as engineers.

August 2000

On the basis of the Malpas Report and of, by now, over 70 detailed responses to the Stage 1 report from industry, business, academia, Government and professional bodies, the Hawley Group developed a 'Forward Vision' for the EngC to attain the strategic objectives that had emerged from Stage 1.

By this time the Hawley Group comprised:

Chairman	Dr Robert Hawley	EngC Chairman
DTI Representatives	Robert Foster	Innovation Services Director
	Tony Kesten	Engineering Policy Unit Head
	Michael Tubbs	Innovations Industrial Advisor
DfEE Representative	John Fuller	NTO Division Divisional Manager
EngC Representatives	Malcolm Shirley	EngC Director General
	Iain Sturrock	EngC Senate Member
Project Director	Paul Langdell	EngC (seconded from Rolls Royce)

Still, it will be noted, there were no direct places for the EEF or EMTA although the DfEE could now act as a channel for their views.

The 'Forward Vision', which responded to the messages urging the need to be radical, innovative and forward-looking on the future role of the EngC, was set out in the Stage 2 (interim) report published on 1 August 2000. This identified an EngC that should:

- Provide a natural focus and leadership of the engineering and technology profession at the highest levels.
- Understand the wider engineering community and be valued by that community.
- Be pro-active in pushing for change in furtherance of the UK economy.
- Be close to business and employers in the wider engineering economy.
- Work with science and new-technology communities to encourage science, engineering and technology teaching in schools and HEIs.

It is noteworthy that this vision was still directed towards development of the *Engineering Council* as such. However, a hint of what was to come lay in the repeated emphasis on the phrase 'engineering and technology' – although readers of this Chronicle will have noticed that since 1983 the EngC had been closely concerned with, and had frequently commented constructively upon, technology in schools, technology in further and higher education and technology in industry.

A few weeks later there was a fresh impetus to the process. On 10 October 2000, Dr Hawley again met Lord Sainsbury who added a greater degree of urgency by seeking a short but definitive report on the future role *before Christmas 2000.* To achieve this target Dr Hawley sought from the Minister and obtained, over £¼ million of funding for research and consultancy. To assist the necessary accelerated progress David Worskett, the recently appointed Director of Communications and Marketing at the EngC, was seconded to the Hawley Group to manage the work.

There was, of course, a large cost to this - the loss to the EngC of its key Communications Director just as his initial efforts in developing the Directorate and its work were beginning. At the same time, although Dr Hawley was Chairman of the EngC as well as of the Hawley Group, he saw as his mission the need to fundamentally change the EngC. This was perceived by some to be diminishing his support of the EngC's current work and the creative changes initiated by his predecessor Chairman. Some Senate members believed that this perceived conflict of interest resulted in a greater focus on the deficiencies of the EngC than on any recognition of its very real achievements. If so, it was claimed that this was inadvertent since Dr Hawley always maintained that he gave full credit both privately and publicly to the EngC for its achievements against its limited 'job description'.

October – December 2000

Be that as it may, in a letter of 26 October 2000 Dr Hawley confirmed to Lord Sainsbury that there would, indeed, be a report to him in December with an outline of the topics to be covered. All this would be linked to the original strategic objectives and "the need to rethink the role of the Engineering Council".

As part of the continuing consultative process there were now several important contributions from the Engineering Institutions. On 30 November 2000 a noteworthy letter to Dr Hawley came jointly from the ICE, IChemE, IEE and IMechE. This stated:

"We accept that challenges implicit in the Hawley Group objectives are indeed ones faced by the Engineering Community. However, we do not believe that the Engineering Council, as currently structured, is capable of delivering the leadership role proposed.

"The [Engineering] Council has a good track record in providing a focal point and working with the Institutions on registration issues….The Engineering Council has also played a part in promoting recognition of the contribution engineering and technology make to society, both to the public at large and, importantly, to those in secondary education…However the Engineering Council has had limited success in co-ordinating the activities of the Institutions and little or no impact on Industry and other interested parties…Perception of the Engineering Council (in particular the narrow base represented by Registrants) and lack of resources have undoubtedly been contributory factors in this situation."

This analysis was followed /by creatively exploring a possible way forward and developing a scenario that, in the light of subsequent events, can only be described as visionary. The four Institutions stated:

"If a body is required to provide a focal point to address the broader objectives identified by Hawley then this body must be a quite different one from the Engineering Council. It must be a body that is representative of a much broader community than the Registrants and one that

is owned by that community and which accepts responsibility for its success and failure. This could not, in our view, be achieved whilst membership of the body is principally made up of individual engineers operating through a Senate.

"The new body needs to be made up not of Registrants but of those organisations which, if they work together, can hope to deliver the broader objectives. The Institutions are one major partner in this but so should be industry (in its various guises), the Royal Academy and academia. The objective of this broader 'Council' would be to agree on what is to be done and then use the resources of the constituent bodies, which far exceed those of the current Engineering Council, to deliver…This structure should engender a sense of ownership which would not develop in the presence of an overarching body.

"The key challenge in creating this 'representative' body would be to avoid it becoming unwieldy…*In this respect it may be appropriate to establish the 'registration' role quite separately from this 'broader' Council - based on the current Board for Engineers Regulation, but modified to give a greater involvement to staff from the major Institutions"* [italics added].

With hindsight it appears that this remarkable and perceptive letter may have subsequently driven the agenda of the four Institutions which, between their memberships, held 64% of all the Registrants and 77% of the Chartered Engineers.

The largest Institution having Incorporated Engineers, the IIE, also gave solid support to the Hawley objectives whilst some of the smaller Institutions too, were active in their response. The Chartered Institution of Building Services Engineers (CIBSE), for example, stated that it was delighted with the Stage 2 Report and strongly supported the range of issues it explored. CIBSE also remarked that sometimes the medium-sized Institutions had the capacity to respond to circumstances more quickly than the larger Institutions.

The December 2000 report to the Minister

With impressive speed by the Hawley Group, the outcome on 15 December 2000 was the report 'Making the Best of Valuable Talent'. The Report, based upon all the inputs received by the Hawley Group, including those from the seven 'review groups' established during Stage 2, and also wide-ranging research commissioned from 'Opinion Leader Research' (OLR), concluded that "the profession no longer serves economic needs adequately". "Already" it said "a large proportion of engineering and technological skills are not adequately catered for by the existing engineering profession (defined as the Engineering Council and the 34 Engineering Institutions)".

The report then proposed a large number of generalised measures; these included comments such as "Implementation of a comprehensive Continuing Professional Development structure should become a top priority" and "New arrangements should be developed to facilitate dialogue between business and the academic community; this should be a major new role for The Engineering Council". [Note the reference was *still* to "The Engineering Council".] There were 40 such recommendations under the following headings:

- Promoting engineering with relevant partners
- Continuing Professional Development
- Engineering Education

- Registration of Engineers
- Future Engineering Impact
- Achieving Consensus
- The Engineering Council

However, under this last heading there were, as it transpired, extremely significant recommendations that "A study of alternative corporate structures should be undertaken" and "there should be research to identify a new name that has the necessary resonance with tomorrow's engineers and technologists".

'Making the Most of Valuable Talent' also usefully included a summary for the EngC of the report of a review team examining communication issues and proposals for 'clusters' of professional Institutions, perhaps remembering the pre-Fairclough clusters of Institutions, termed Engineering Group Committees in the 1980s [see Chapter 3].

February 2001

The Genesis of the Engineering and Technology Board

After discussions in various venues on 'Making the Most of Valuable Talent', Dr Hawley, at one of the final meetings of his Group in December 2000, introduced the idea of the actual *replacement* of the EngC by a completely new body that would do all that the EngC was perceived as having failed to achieve, particularly in communicating and promoting engineering and engaging the wider engineering community. This was much in line with the joint letter of 30 November from the 'Big 4' described above.

Broadly agreed by the Group (which it will be recalled included the EngC's Director General, Malcolm Shirley) it was decided to announce this fundamental change at a major forum for the key stakeholders on 14 February 2001 to be held at the Institution of Electrical Engineers. We may note that the IMechE Journal *Professional Engineer* was not alone in remarking on the association of this date with both alliances and massacres ! A major task in ensuring the success of this event was persuading the Institutions of the merits of the creation of a new body, and this task fell to Malcolm Shirley. Personal meetings and briefings with Chief Executives and Presidents of the majority of Institutions prior to the event resulted in their agreement to support the idea, the vision and aims of which could hardly be disputed.

Among those attending the St Valentine's Day meeting were representatives from the Construction Industry Council, UKAPE, EEF and EMTA, besides many from industry and the Engineering Institutions. Lord Sainsbury and Dr Hawley addressed the140 delegates and announced the proposed formation of a new 'Engineering and Technology Board' (ETB).

Dr Hawley said " The creation of the ETB … shifts the focus from the engineering profession to the wider engineering and technology community…It creates an opportunity for everyone working in the wider world of engineering and technology to make a greater, co-ordinated and more valuable contribution to the businesses and industries in which our talents are deployed…The ETB will be a totally different organisation from the existing Engineering Council…will be fundamentally different in structure, purpose, image and ability to influence. It will be designed to achieve the step change referred to by the Minister." "The ETB" he continued, "will respond to market needs in ways which are relevant, timely and in keeping with the rapidly changing dynamics of the technology world. It is about

working on behalf of - and for the benefit of – the whole of the wider engineering and technology community".

Dr Hawley acknowledged that the changes had implications for financing in the future. "The ETB must seek new income streams and resources. It must reduce dependence on registration subscriptions. It must be self-sufficient and sustainable".

Despite an excellent presentation and the opportunity for some discussion, it was the feeling of some delegates that the 14 February meeting had simply been a cleverly stage-managed event with little opportunity for the expression of contrary views. Nevertheless, the EngC Director General, Malcolm Shirley, said in a letter "The forum was, in everyone's view, a great success. The presentation of a framework for taking the Hawley Group recommendations forward in a wholly inclusive way received complete agreement and there was an impressive level of enthusiasm for involvement". But, as it later transpired, Malcolm Shirley was to have mounting doubts that eventually led to his early departure from his post.

The Shadow ETB Board

The framework proposed by Dr Hawley comprised a Shadow Board and a number of working groups. The Shadow Board had the following terms of reference and membership:

Terms of Reference

To ensure that the ETB is established by October 2001; to approve proposals for the constitution and structure of the new Board and the body to regulate the engineering profession; to identify an appropriate Chairman for the ETB, and recommend a role for the Duke of Kent (current EngC President); to be accountable for the financing of the transitional work programme; to take any operational or practical decisions that are required in the interim period; and if required to provide advice to the Government on the views of the wider engineering and technology community.

Membership

Dr Robert Hawley (Chairman)	
Sir Joseph Dwyer	Institution of Civil Engineers
Keith Read	Institution of Marine Engineers
Martin Temple	EEF
Michael Sanderson	EMTA
Mandy Mayer	DTI
Malcolm Shirley	Engineering Council
Professor Patrick Dowling	University of Surrey
Michael Kipp	BAE Systems
Iain Sturrock	Nortel
Alastair Macdonald	British Computer Society
Paul Langdell (Secretary)	Support team member

This was now the *all-inclusive body* wanted by the Minister with academia, the Institutions, industry and Government represented round the table. It is notable that, remembering their original reservations about the remit of the Hawley initiative, the EEF and EMTA were now present. Hopefully this was a good augury for the future.

The six working groups were:

- Constitution and Governance
  Chairman: Alastair Macdonald, President of the British Computer Society
- Business and Industry Needs
  Chairman: Robert Marshall, Chief Executive of Marshall Specialist Vehicles
- Communications Group
  Chairman: Peter Briggs, Chief Executive of the British Association
- Attracting Greater Membership of Institutions and Registration
  Chairman: Dr Philip Secker, former Managing Director of the IEE
- Education and Training
  Chairman: Lord Trefgarne, Chairman of EMTA
- Continuing Professional Development
  Chairman: Dr Alf Roberts, Chief Executive of the IEE

It was soon concluded that, notwithstanding the evident success of the 14 February meeting, the functional task of regulation did not sit comfortably with the visionary, strategic role of the ETB. As a result, the Shadow Board decided that there would also need to be a separate, though associated, Board to which they gave the working title 'New Regulatory Body' (NRB). This development was made the responsibility of the key 'Constitution and Governance' Group. The proposal for two bodies was completely in line with the letter from the Institutions referred to in the October to December 2000 period above.

Constitution and Governance of the ETB and the New Regulatory Body

Members

Alastair Macdonald	Chairman
Bill Dennay	Institution of Incorporated Engineers
Louise Kingham	Institute of Energy
Sir Michael Moore	Institution of Mechanical Engineers
John Robinson	Institution of Chemical Engineers
Trevor Truman	Royal Aeronautical Society
Professor Mike Sterling	Brunel University
Andy Scott	CBI
Anne Minto	Smiths Industries
Robert Bulling	Allen & Overy
Malcolm Shirley	Engineering Council
David Worskett	Secretary to the Working Group

Terms of Reference

To prepare recommendations for the structure and corporate governance of the ETB, and the associated regulatory body, taking account of all stakeholders, in time for the new Board to become fully active in October 2001.

Specific tasks

- Define the 'stakeholders' and their relative weighting and significance for the ETB.
- Review possible corporate governance 'models' and recommend a preferred approach.

- Identify and resolve legal issues in respect of the above.
- Recommend how to manage the change from the "old" EngC to the ETB and New Regulatory Body (NRB).
- Recommend a subsidiary Board or Advisory Panel structure within the ETB which supports all of its specific functions.
- Develop a financial model and business plan for the ETB.
- Explore the breadth and depth of regulation to be undertaken in the future by the New Regulatory Body.

This was a comprehensive set of tasks not the least difficult of which, recalling the record of the CEI and now of the EngC, would be to determine the size and character of the eventual ETB Board and its main subsidiary groups. Who were the stakeholders? How would members be chosen, by election or appointment? Would they serve in an individual capacity or be representatives of the Institutions? In what respects, if any, would Registrants have a special position? These were thorny questions that had caused endless discussion and disharmony in the predecessor bodies.

Mid 2001

The Consultative Process on the ETB and NRB

To assist progress, the EngC's Communications Director David Worskett, now acquiring the title of ETB Executive Director, together with the Project Director Paul Langdell, moved offices to Savoy Hill House to be their centre of operation. This development phase was fully funded by the DTI.

Wisely, the Shadow Board used IT to disseminate its thoughts and seek opinions from as wide an audience as possible – in fact to create, as it claimed, 'an inclusive process'. A web-based consultative framework was established immediately following the February conference. It consisted of some 250 people drawn from across the technology and engineering sector. Over 150 people actively participated in the special websites. The six Working Groups listed above, consisting of 'corresponding' as well as full members, contributed to the development of proposals for the ETB. Every Working Group had at least one 'young professional engineer' as a member and the 'Professional Young Engineers' group organised a number of useful seminars to provide contributions.

The interactive custom-designed internet site could be accessed, after registration, using the password 'Stephenson ' (what else!) and dozens of committee papers and inputs of individuals and groups by correspondence could be viewed. Not surprisingly, the Engineering Institutions were prominent in this process and formed pressure groups to put their case. The most prominent of these was the 'G10' Group consisting of representatives of 10 large Institutions. The Chairman of G10 was Dr Trevor Evans, Secretary of the Institution of Chemical Engineers. Dr Evans had a long history of involvement being the only surviving Secretary of the 'Big 4' Institutions from the time the Engineering Council was formed back in 1982 and subsequently made many characteristically independent inputs to its discussions and policies. However, the involvement of the G10 Group had the predictable effect of making the smaller Institutions feel left out, so they then formed the G26 Group.

The Constitution and Governance Panel set up a committee to propose the structure and terms of reference for the "New Regulatory Body". This committee was chaired by Dr Trevor

Evans with senior staff representatives from all of the G10. It reported through Sir Michael Moore to the Panel. Its recommendations were all accepted.

By means of the G10 and G26 Groups and other channels of communication, the Institutions both large and small promoted their ideas on future involvement mainly, though not entirely, with the aim of securing strong *representation* (that is, their members not just being appointed as *individuals*) on the new emerging bodies. But there were many other counterbalancing contributions from various sources that felt the Institutions and Registrants should not hold too great a sway within the newly defined 'wider engineering community'.

In order to get through a very tight programme that was obviously extremely urgent, Dr Hawley had always maintained that he would step down from the EngC after his 3-year term at the end of 2001, thereby defining the entire timetable. Although requested to stay on, he judged that if he remained another twelve months, it would "simply take another year to complete the programme". This attitude resulted in intense and successful efforts by his colleagues, David Worskett, Paul Langdell (and team) and the ETB Board – particularly Alastair Macdonald.

Activities at the Engineering Council

While all this was going on what was happening back at the ranch? At the top level of the EngC, in addition to losing one of its two key operational Directors, those running the show had the added problem of increasingly being seen as a body about to be done away with. The Chairman sought to support the EngC's continuing work by reminding the profession of its achievements. However, this was seen by some simply as a gesture that sat uneasily with the parallel moves to replace it. Indeed making the case for the ETB unfortunately involved some discrediting of the EngC, even if this was not the intention. But again to some, this appeared to be part of the project team's strategy in promoting the ETB.

At staff level, besides the fears for job security among EngC staff, there was a feeling that much good work was either deliberately or inadvertently ignored. Examples were held aloft such as WISE, YEB, SARTOR, Neighbourhood Engineers, Industry Affiliates, many press campaigns, considerable successes in the acceptance of UK engineering qualifications overseas and comment on matters of national concern. The generally successful attempts to deal with Institutions' intransigence and unwillingness to be harnessed to a common cause within a federal structure were also quoted. But, as already mentioned, there had been a dearth of *new* activities in the past few years. It is true there had been some updating of effort - considerable on SARTOR-3 and the re-invigoration of the Industry Affiliate Scheme. In addition, the auditing and licensing procedures for Institutions had been brought into line with nationally accepted standards. But, and again it has to be mentioned, the potential of the MOU with Government had hardly been tapped and the Public Affairs' efforts had faltered. Consequently, a fresh initiative to improve the performance of the EngC could easily be justified.

The apprehension at Maltravers Street was unevenly spread. It was less within the Engineers' Regulation Directorate (now on the 5th Floor) because the Hawley Initiative had accepted that a successor organisation would have to continue the regulatory function. So the business of licensing of Institutions and registration would probably involve a continuation of many, if not most, of the DER staff duties. It was different on the 6th Floor where the Engineering

Profession Directorate staff could envisage that all of their work would be superseded by the remit for the ETB.

At this point it is fitting to pay a warm tribute to all the EngC staff who not only kept their efforts going at a very difficult time when their future was uncertain, but also enhanced some procedures, for example in the areas of regulation and Industry Affiliates.

August 2001

Reconsideration of the ERB/NRB Relationship

By the summer of 2001 feelings were beginning to grow that the two-body solution – an NRB more or less separate from ERB - was not the best way forward, The DTI was particularly worried that there were already too many bodies involved in the management of engineering. In fact, in a letter of 1August 2001 Alastair Macdonald, the Chairman of the Constitution and Governance Group, wrote to the Shadow Board that at a meeting held the previous day in which he, David Worskett and Dr Hawley met Lord Sainsbury, the Minister had stated that "the proposals which had been developed …would have no chance of securing DTI approval… or indeed of securing additional Government funding". The DTI had two major concerns :

- The strong call from business and industry for clarity and simplicity in the new organisation, for the creation of a single focal point for the wide community, and the avoidance of any ambiguity in this respect.
- The need to be absolutely certain that the influence of the 'wider community', and the customers could and would be fully and effectively brought to bear on the processes of regulation, accreditation and registration.

Consequently, at a late date, the focus moved to *a single body* ETB encompassing an NRB, giving the former a strong input to the latter. It was realised that unless done sensitively this would run into opposition from the Institutions because of their traditional influence on regulation, accreditation and registration matters. Also, the single-body model carried the possibility, an anathema to some, that the result would simply be a reinvention of the EngC. Not only that, but a proposal was on the table that the NRB should be staffed by the EngC Regulation Directorate (one would have thought an eminently sensible idea remembering the specialist skills and knowledge required) and, more controversially, that the initial core staff of the ETB should be drawn from the EngC Communications Directorate *and* that both groups should remain in Maltravers Street supported by the EngC Finance and Administration Directorate. It was suggested that all EngC activities such as Neighbourhood Engineers should transfer, at least at first, to the ETB.

September 2001

These ideas, though of considerable merit in view of the Minister's decision that there should be a single ETB/NRB organisation and the need to put in place judicious transition arrangements, were received with less than acclamation by the G10 Group of the biggest Institutions. In fact the Group sent an e-mail to Alastair Macdonald on 3 September 2001 and a letter on 5 September in which it was suggested that the proposed terms of reference for the Registrants' panel, one of the five panels reporting to the ETB (see below), were bluntly offensive from an Institution's point of view. The Group was particularly incensed by the

proposal that the panel would initially be elected from the members of the EngC Senate who had been elected by the Registrants (i.e. they were not to be Institution nominees); the Group asked what had become of the "new, leaner organisation" if there were to be a carry-over of staff, premises and projects. The letter alleged that the Institutions were being marginalized and concluded "For all that is done to spin this outcome to the media, Registrants and Senators, Engineering Council staff and business, you won't solve the problems …. unless Institutions are accepted as the voice of their members ".

However, these reservations of the Institutions did not appear (at least at that stage) to affect significantly the outcome of the deliberations of the Shadow Board. Acting on the advice of its six working groups a report was posted on the web-site in August (revised slightly on 24 September 2001) and headed: 'The Organisation and Structure of the Engineering and Technology Board'. It proposed that the ETB Board should, through its actions, "conspicuously add value to the wider engineering community and to the community's role in improving the quality of life and creating wealth". *Within* the structure of the ETB would be a 'New Regulatory Body' (NRB) which would carry out broadly the regulatory and registration functions of the EngC, including representing the UK overseas on engineering qualification issues.

The Role of the ETB

It was proposed that the ETB would be a company limited by guarantee and would have charitable status. The Board, of some 15 members, would include representatives with experience of:

- The education sector
- Business and industry in the wider engineering and technology community
- Professional Engineering Institutions and associated bodies
- Industrial and business training
- Financial management
- High level communication skills

It would include the Chairman of the NRB and the Chairmen of any Panels established to assist the attainment of the primary objectives which were:

1 – Start the reversal in the downward trend in the supply of people with qualifications and skills relevant to engineering and technology based careers and jobs.
2 – Achieve a marked and noticeable shift in public attitudes towards an understanding of the importance and value of engineering and technology in today's economy.
3 – Build effective and valued links with business and industry reflecting its real time and future needs.
4 – Review and maintain the professional standards required to meet industry's needs and maintain an authoritative register of appropriately qualified individuals.

A number of panels, each of up to twelve members, plus a Chairman, was proposed in relation to these objectives. The panels were named as:

- Life-long Development
- Communications
- Business and Industry

- The Wider Community
- Registrants

It was proposed that at least two members of *every* panel must be Registered Engineers chosen from nominations put forward by the Institutions through a democratic process. In addition, the Chairman of the ETB would have an informal International Advisory Group to provide a global input on relevant areas of engineering and technology.

The Role of the NRB

'The New Regulatory Board' – a name, which it was recognised, was only a working title – would have not more than 22 members of whom 14 would be *representatives* of licensed Institutions, chosen on a formula according to size of Institution membership. The largest Institutions would each have its own seat while the smaller ones would share seats in rotation. The remaining eight members would be appointed by the ETB to provide representation across the community including the public at large. The NRB would elect its own chairman from among its Institution members. This was a compromise formula which, it was hoped, would satisfy on the one hand the DTI requirement that there should be a single body and on the other the Institutions' expectations that they would effectively control the NRB.

The terms of reference of the NRB included setting the standards for registration and maintaining the Register of CEngs, IEngs and EngTechs together with the licensing of Institutions to accredit courses. Also, significantly, the ETB would act as the UK representative body in matters that related to the international recognition of UK Registered Engineers and Technologists. All this would substantially be a continuation of the work undertaken by the existing BER. Because of its professional regulatory function, it was planned for the NRB (or whatever name was finally chosen) to be Chartered. Thus there would be created the rather unusual situation of a Chartered body being responsible to a non-chartered ETB rather than directly to the Privy Council. It remained to be seen if this would gain Privy Council approval.

Proposed Financial Arrangements

At this stage the ETB, of course, had no existence. No designated Chairman, agreed Board Members, Chief Executive, staff offices, administration or even a firm financial package.

However, proposed financial arrangements for the ETB and the NRB were outlined in the September 2001 report. An income of some £7 million a year was picked as the target for each of the first two years. Some 60% of this was to come from Registrants' fees – a source inherited from the EngC. The key proposal was that the Registrants' fees would go not to the NRB but to the ETB which would fund the NRB from its budget.

So far as the Institutions were concerned there was a wary acceptance of the proposals rather than widespread enthusiasm. The fact that the majority of the funding of ETB was planned to come from Registrants' fees was bound to be of importance to Institutions and would give them a potential lever on the ETB. They would, however, be pleased at long last to have *representatives* on the NRB. This would give them a much higher degree of influence on registration matters than they had hitherto enjoyed – though it is fair to add that on the registration front there had been no fundamental difficulties between the EngC and the licensed bodies – as acknowledged in the 'Big 4' letter of 30 November 2000 quoted above.

All the same, the Institutions would now be on an inside rather than an outside track and would be able to control the registration agenda much as they had done in the old CEI days. In retrospect the arrangements can be seen as a deal, formal or tacitly understood, in which the ETB got the Registrants' fees and the Institutions got their long sought representation on the registration body.

Some individual Registrants wrote to say that they should have been consulted about the new arrangements since it was largely their money that was to finance the ETB. And, indeed, it will be recalled that when the EngC replaced the CEI, a process that had involved just such a transfer of funds, there was actually a referendum among the Professional (Chartered) Engineers. The proposed loss of democracy, as some saw it, was likely to remain a problem area because there would no longer be direct election to either the ETB or the NRB, as there was to the EngC Senate.

The Shadow Board met on 5 September 2001 to finalise its proposals. At a subsequent meeting on the same day with Lord Sainsbury, the main elements were agreed for linkages between the ETB and the proposed New Regulatory Body.

The Director General's Departure

The EngC's Director General, Malcolm Shirley, had by now become increasingly worried and disillusioned by the trend of events. He felt that whenever progress towards the ETB had faltered, the rationale for the new body was increasingly being bolstered by emphasising the perceived failures of the Engineering Council. *His* perception, to the contrary, was that the relationships and dialogue within the profession were actually working more harmoniously than they had done for years. In essence he felt that virtually everything proposed for the ETB could have been accomplished by the EngC, had the same amount of resource (extra Government money and effort) been devoted to it. This, indeed, might have been the case if the 1997 MOU had been exploited immediately after being signed. In expressing such views directly Malcolm Shirley was now on a collision course with Dr Hawley.

Then early in September Dr Hawley arranged a meeting with his EngC Advisory Board members when he recommended that the EngC should dispense with Malcolm Shirley's services. This was a bolt out of the blue to some members of the Advisory Board. But the unanimous feeling was that if an unbridgeable gap had developed between the Chairman and the Director General, then in the interests of the EngC there was no alternative.
Malcolm Shirley was then offered an agreement and given two days to accept and leave the EngC. Andrew Ramsay the Director of the EngC's BER was appointed acting Director General, at the same time retaining his responsibility as Director for Engineers' Regulation.

This news of Malcolm Shirley's departure was conveyed by letter to the EngC staff on the following day – 6 September 2001. Dr Hawley had previously arranged to address the staff on that day and did so at 4.30 pm with a briefing on the current position. Some staff felt reassured by the Chairman's remarks that their contributions were valued, others were less confident. In any case, Malcolm Shirley left on 7 September 2001. An EngC Media Release of 10 September announced the changes and acknowledged the substantial contribution Malcolm Shirley had made during his three years as Director General, as indeed he had – a point which had also been made previously in Dr Hawley's letter to the EngC staff.

Arrangements for Approval

It now remained for the Hawley Group to obtain the approval of the EngC Senate for the proposals. This could have been something of a delicate matter with a whiff of 'the turkeys voting for Christmas' about it. Already some letters were appearing in Institution journals expressing concern about the apparent loss of democracy for Registrants and lack of targeted consultation. The Hawley Group replied to these and also carried out an information and lobbying effort aimed at Senate members. It was sensibly planned that Senate approval would be in two stages. The first would be at the Senate meeting on 3 October 2001 when approval for the ETB/NRB arrangement would be sought. This would include agreement for the creation of the ETB based on a document called the blueprint – broadly described above – and to a loan from EngC funds to enable the embryo ETB to operate to the end of the year. A simple majority would be needed at that stage for the enabling resolutions to be passed. The second stage would be at the following Senate meeting in December when the EngC would be asked to agree to the transfer of the Royal Charter –subject of course to Privy Council approval. This second stage would require a two-thirds majority.

October 2001

The 1st Stage – Senate Meeting of October 2001

At the Senate meeting on 3 October 2001 Dr Hawley made a persuasive presentation covering the proposed ETB/NRB roles, priorities and financial arrangements as outlined above. He described the sequence of events and consultations that had taken place since the start of the initiative in late 1999 and pointed out that Senate had been kept fully informed. He stressed that the work since February 2001 had been an inclusive process overseen by the Shadow Board that had involved representatives of business and industry, academia, the Institutions, Government and Senate members.

Dr Hawley claimed that the ETB would be a huge step forward, with a complete change of emphasis. The ETB would, he trusted, relate to the whole of the wider engineering and technology community - that meant some 2 million highly skilled people, not just the traditional 'profession', who in the UK numbered just 8% of the 'wider community'. This, he believed, would allow proper links to be built with that wider community, its economic importance to be understood and its voice to be recognised by Government. The Engineering Council, Dr Hawley stated, could not do this as its terms of reference were too narrow (although according to the 1997 MOU they were not). He believed, however, that the ETB would be able to integrate existing activities and harness the efforts of its constituent members. This would, over time, make it easier to attract significant extra funding from business and Government.

As far as the NRB was concerned, Dr Hawley underlined that the proposals would allow the continuation of self-regulation for the profession…*and the very strong position developed by the Engineering Council's Board for Engineers Regulation would thus be maintained.* Whilst Institutions would provide two-thirds of the members of the new Board [note: thus satisfying the long sought quest for representatives]. The remaining third would be nominated by the ETB to provide the wider degree of public accountability expected of all the senior professions.

Dr Hawley referred also to two other important matters. The first was the proposed financial arrangements; briefly, the NRB would have about 45% of Registrants' fees or £2.1 million

for the processes of regulation which was about the same as was currently spent on BER matters while the ETB would retain the balance for its purposes. The second matter was that of "Registrants' democracy". The existing situation, it will be remembered, was that Registered Engineers directly elected Senate members. The new proposals meant this democratic element would be lost and replaced by Institution representatives nominated by the Institutions. The underlying assumption was that the Institutions themselves were democratically governed bodies.

Dr Hawley accepted that strong feelings existed about the possible loss of the democratic element. He undertook that the Shadow Board would keep this matter under review and that a process would be put in place to ensure that the ETB and the NRB were fully advised of concerns and ideas coming from Registrants through the Institutions. He also suggested that the two Registrant members of each of the ETB panels [see above] might be elected first by this Senate and subsequently by Institution processes. He also suggested that that democracy would be even stronger if the Chairman of the Registrants' Panel [note : see 'Role of ETB' above] was elected by the members of the panel or - and this was his preference- by an electronic ballot of all Registrants.

Dr Hawley concluded his remarks by emphasising that this was a unique opportunity that had to be seized. He felt that the 'status quo' was not an option and that the credibility and reputation of the profession now depended upon moving forward with arrangements that broadened the vision and brought in the 'wider community'. He stressed the unprecedented strong support from all the main players – the Institutions, industry, Government and academia.

In the debate that followed Dr Hawley's powerful address, a number of members expressed themselves generally in agreement with the proposals. Mainly the points of concern from others again centred on (i) the financial aspects and the propriety of passing funds to the ERB without first seeking the views of Registrants and (ii) the changes affecting the democratic process as far as Registrants were concerned. These concerns led to a number of amendments being proposed to the three resolutions and to address these Dr Hawley adjourned the meeting for 15 minutes.

On reconvening, the Senate considered the revised resolutions that were then passed with large majorities. The resolutions are given below with italicised amendments to the original text.

1. "that the 'Engineering and Technology Board' be incorporated as a company limited by guarantee, with initial members and directors as nominated by the ETB Shadow Board's Nominations Committee and a governance structure as detailed to take over from the Engineering Council its main promotional activities, receiving all registration fees for 2002 and subsequent years previously collected by the Engineering Council, and providing therefrom the funding required for future regulatory activities; and the above to be subject to : (*i) a proviso that there be elected majority representation in the governance of the ETB (ii) the budget for future regulatory activities being set by the NRB (iii) the level of registration fees to be levied on Registrants being a matter for the ongoing Registrants' Panel which will annually make a recommendation to the ETB".* [Note: This can be seen as part of the 'ring fencing' of finance for the NRB.]
2. "that a formal petition to The Queen in Council be drafted seeking the grant of further Supplemental Charter to the Engineering Council, seeking to replace the Council's

current powers and governance structure of the Senate and its two Boards, with the structure in Paper ECS(P)22/01 – for formal approval by the Senate at its meeting to be held on 6 December 2001.

3. "to delegate the responsibility to the Engineering Council's Finance and Audit Committee to determine the proportion of the Council's reserves to be transferred to the 'Engineering and Technology Board', and pending that determination based upon the Council's audited accounts as at 31 December 2001, to advance by unsecured loan, up to a maximum of £500 000, to allow that company to fund its initial operations. *Should approval of the Supplementary Charter not be forthcoming, no further transfer of the assets of the Engineering Council shall take place".*

The Shadow Board, responding to the Senate discussion and to the resulting amendments, issued a press release on 18 October 2001 stating that the expressed concerns would be met by instituting an 'Electoral College' system that would ensure democratic representation for Registrants and for stakeholders from the 'wider community'. This Electoral College idea was to be taken forward at the next meeting in December of Senate.

At the same Senate meeting of 3 October 2001, the Acting Director General Andrew Ramsay reported on current developments stemming from the Activity Review and the anticipated transition to the ETB. He made the following points:

- Although there was understandable uncertainty over their individual futures, staff had become increasingly aware of the opportunities offered to them by the ETB proposals. Staff morale had been boosted by the Finance and Audit Committee's agreement to a comprehensive redundancy and outplacement scheme that would give effective help to those unable to find employment in the new organisation.
- Planning was taking place to transfer mature Engineering Council activities to other appropriate parties.
- The City and Guilds of London Institute was to take over the marketing and administration of the Engineering Council Examinations.
- Negotiations for the transfer of the 'Young Engineers for Britain' to the 'Young Engineers' clubs' were well advanced.
- It was hoped that the 'Neighbourhood Engineers' project would be merged with 'SETNET' in order to benefit from the Government's 'Science and Engineering Ambassadors' initiative.
- The Industry Affiliate Network continued to run a full programme of meetings and newsletters. [Added note: it was soon transferred to the ETB.]
- A successful meeting had been held with Institution Chief Executives, and Andrew Ramsay had been invited to meetings of different groupings of Institutions.
- The EngC was involved in detailed negotiations over issues arising from the previous month's White Paper on Secondary Education.
- In the International recognition arena there had been successful negotiations to launch the 'Engineer's Mobility Forum' (EMF) – a development towards the full international mutual recognition of professional qualifications such as CEng. This built upon the success of the 'Washington Accord', originally conceived in 1985 at Maltravers Street by the then British International Committee for International Engineering Affairs, which led to the mutual recognition among a number of countries of accredited engineering degrees.

November 2001

The Engineering and Technology Board Launched

The ETB officially came into being on 14 November 2001 as a company limited by guarantee and a registered charity. The membership was:

Dr Robert Hawley (Chairman)	
Sir Peter Williams	St Catherine's College, Oxford
Sir Joseph Dwyer	Institution of Civil Engineers
Keith Read	Institution of Marine Engineers
Martin Temple	EEF
Michael Sanderson	EMTA
Mandy Mayer	DTI
Andrew Ramsay	Engineering Council
Professor Patrick Dowling	University of Surrey
Michael Kipp	BAE Systems
Iain Sturrock	Nortel
Alastair Macdonald	British Computer Society

This was identical to the Shadow Board except in two respects. Andrew Ramsay, the acting Director General of the EngC replaced the departed Malcolm Shirley while Sir Peter Williams joined as Chairman-elect. It was planned that he would succeed Dr Hawley on 1 January 2002.

Sir Peter's appointment augured well for the ETB. He came with a distinguished industrial and academic career, a fitting combination for the Chairman of the ETB. He had been managing director at Oxford Instruments for 17 years and was Master of St Catherine's College Oxford, Chairman of the Science Museum and President of the Institute of Physics. Fortunately for the 2-day a week ETB post, he was due to relinquish all of these shortly. He planned to retain however his Board membership at GKN and was about to take over as President of the British Association for the Advancement of Science which could be seen as dovetailing quite nicely with the aims of the ETB.

Additionally Sir Peter knew of the background having been a member of the EngC Senate from 1996 to 1998. He acknowledged, in an interview reported in the IMechE journal *Professional Engineer*, that "The Engineering Council was a step forward … the ETB takes us forward again … the ETB job is a huge honour and something I absolutely want to do… the real appeal is the ETB's task of bringing engineering out into the wider community ... the job is to broaden the horizons of engineering, to include people who hadn't considered themselves part of it… maybe 2 million of them, according to the Malpas Report of last year that looked into how many people use engineering methods or ideas in their daily work".

On the other side of the coin, Sir Peter was quick to reassure existing professional engineers and their Institutions that he would be working with them, not against them. The interview in the *Professional Engineer* concluded with his words "the ETB will be the body to focus all the effort and reinforce it. My task will be to persuade ETB Board Members that they not only have a responsibility to Registrants and constituents but also a wider responsibility to the ETB and what it stands for. If we end up voting on constituency lines, we will have failed. But we won't do that".

December 2001

The 2nd Stage – Senate Meeting of December

At this vital meeting the arrangements for the NRB, the formation of Electoral Colleges and a draft supplemental Charter and Bye-laws were presented by Dr Hawley and David Worskett.

A new name for the NRB

An important step was taken with a fresh recommendation concerning the name of the Chartered part of the ETB, until now known as the NRB. After listening to legal advice and debates with the Institutions, including a meeting of Presidents, where the ultimately chosen name found approval, the Senate considered possible alternatives and agreed that the new name should be 'Engineering Council (UK)' with the abbreviation EC(UK), later changed to EC^{UK}.

The Shadow ETB Board saw decided advantages in a minimal change because, as it reported, the existing Engineering Council had developed a 'brand' that was recognised and respected by the majority of actual and potential Registrants. Equally importantly, it had become widely known and admired overseas where it was accepted as a body able to promote international recognition of UK engineering qualifications. The new name had been recommended by the Chairman's Advisory Group and had been endorsed at the first meeting of the ETB that, by now, had been established with the membership identified above. The new Charter and Bye-laws would replace the Senate while its two Boards (the BEP and the BER) would be replaced by a single Board. The new EC(UK) Board would comprise 22 members, 15 of whom were to be elected by the licensed Engineering Institutions (so giving them their long sought *representatives*), and 7 of whom were to be appointed by the ETB in order to provide balance and the necessary degree of public accountability.

The new EC(UK) Board, substantially a replacement for the BER, reflected the narrower responsibilities of the EC(UK) compared with the EngC. It was to retain the previous Charter responsibilities of the BER, including setting standards for accredited courses and codes of conduct, maintaining the Register and licensing Institutions but, on the whole, with stronger emphasis on the regulatory functions. There were, however, two major new provisions in the remit for the EC(UK). The first was the requirement to 'participate on behalf of Registrants, in the work of the Engineering and Technology Board and respond to proposals and enquiries made by the said Board concerning regulation of the profession'. The second was 'to act as the representative body of Our United Kingdom in relation to the international recognition of Registrants and of qualifications in engineering and related subjects and disciplines'. This last provision was a welcome formalisation of a semi-formal arrangement with the Institutions that had existed, not without difficulties, from the early days of the EngC.

The Electoral Colleges

The proposals on Electoral Colleges were made in response to concerns expressed at the previous October meeting on the question of mechanisms for democratic processes to determine the membership of the ETB. Each College would select a number of its members to be put to the Nominations Committee of the ETB. The Nominations Committee, consisting of the ETB chairman, and two other Board members together with the Presidents of the Royal Academy of Engineering, the Royal Society and the Engineering Employers Association,

would then choose from among these and any other nominations received in order to achieve a balanced membership for the ETB. So, although eight of the fifteen Board members will come through the electoral colleges, the final filtering was intended to produce the required proportionate sense of balance. Three Colleges were envisaged:

- College 'A', the Registrants' College – Members for the ETB would be proposed to the Nominations Committee by the EngC Senate. Subsequently the EC(UK) Board would make the proposals. The members of College 'A' would also be members of the ETB itself and have the right to attend and vote at its AGM. The first four proposed to represent the profession on the ETB were Claire Curtis-Thomas MP, Michael Fabricant MP, Air Marshall Sir Colin Terry and Andrew Burton.
- College 'B', a Stakeholders' College for representative bodies such as the EEF, RAEng and EMTA.
- College 'C', a Stakeholders' College for companies.

The ETB's Registrants' Panel (one of the five panels listed above under 'The Role of the ETB), would be a permanent on-going representative panel and, to assist its impact, its Chairman would have a place of right on the ETB Board and so would also need to be one of the members elected from College 'A'.

On the financial side of ETB David Worskett reported that:

> 1) Although Registrants would provide 100% of the funding for the regulatory function their fees accounted for only 48% of ETB income.
> 2) There was a decision in principle that the DTI would provide core funding of just under £1 million per annum for each of the first two years. After that, project funding of approximately £0.8 million per annum would be sought from the Government.
> 3) Further discussions were to be held with the DfES over its contribution to core funding.

Draft Supplemental Charter

The draft Supplemental Charter included a provision that the first Chairman of the new EC(UK) should be Professor Patrick Dowling CBE, FREng, CEng, FRS, Vice Chancellor of the University of Surrey. Although this was done apparently without consultation with the Institutions, it was a perfectly logical move because Professor Dowling, being the current Chairman of the BER, was in an excellent position to ensure that the essential central EC(UK) activities of Regulation and Registration would continue seamlessly. It was envisaged that Professor Dowling would succeed Dr Hawley as Chairman of Senate on 1 January 2002 and also retain his Chairmanship of the BER until he became the first Chairman of EC(UK) to begin the new era.

It was agreed that Professor Dowling should continue as Chairman for a limited transitional period and he accepted this in the interests of the profession. Following an election by the EC(UK) Board in the Spring of 2002 Professor Dowling was succeeded by Sir Colin Terry.

2002

Appointment of ETB Chief Executive

The appointment of Sir Peter Williams as ETB Chairman was to be followed by the appointment of a Chief Executive Officer, a post advertised on 12 November 2001 at an industrial rather than Institution or academic salary. The result announced on 7 March 2002 was the appointment of Alan Clark to take effect from 14 April. Alan Clark had taken an engineering degree at the University of Bath and an MBA at the University of Hartford, Connecticut. He spent much of his career with GEC(USA) both in Europe and the USA becoming Vice-President Electrical Distribution and Control. Most recently he had been with Novar plc as Chief Executive of their Intelligent Building Sector. On his appointment to the ETB he commented:

"I am delighted to be joining the ETB as its first Chief Executive. Trained as an Engineer, my career has been spent mainly in tackling the business issues of major corporations but always with engineering and technology as the key drivers. I firmly believe that an appropriate engineering and science based culture is essential to national competitiveness and that the ETB has a key role to play. I look forward to working with Peter Williams and with all our partners in industry, education and the engineering profession".

An Appraisal of the Hawley Initiative

At this point a tribute must be made to Dr Robert Hawley. He had inspired and strongly led a remarkably rapid transformation of the EngC into the ETB and the linked EC(UK). In the words of Professor Dowling at the end of Dr Hawley's final meeting as chairman of the EngC, "he had provided leadership and vision backed by hard work as Chairman of Senate since February 1999. He had faced a huge challenge following his initial meeting with Lord Sainsbury, and had tackled this with enthusiasm and energy. This work had required an enormous time commitment, and had succeeded in laying the foundations on which a solid future could surely be built.

At the heart of the problem facing the Shadow Board was the need to formulate aims that would carry conviction and take the engineering and technology banner forward in directions the EngC either had not, or could not, follow. But crucially this had to be accomplished within an administrative and driving structure that would satisfy and balance the interests of Institutions, Registrants and many other organisational stakeholders, not to mention the concerns of Government. And there had also to be a convincing democratic element in the way the various Boards and Committees were formed.

The solution arrived at by the Hawley Group was undoubtedly a skilful attempt to meet these disparate requirements. The idea of a broad-based ETB constituted as a company limited by guarantee, linked financially and structurally to a Chartered EC(UK) responsible for registration and standards had much to commend it. The Institutions gained *representation* on the Board of the new EC(UK) – but this was short of full control because about one-third of the members would be nominated by the ETB. Conversely the Institutions would be in a position to influence membership of the ETB by nominating through Electoral College 'A'.

Organisational stakeholders and individual employers could be represented on the ETB through the other Electoral Colleges, the ETB retaining an element of choice through its

Nominations Committee in order to achieve an appropriate balance among it membership. Limited to some 15 members, the ETB would be more agile than the unwieldy 50 member Senate of the EngC.

However – and a big "However" – the ETB was established without any real power. It does not have the force of a statutory body or even the official stamp of a Chartered body. Any successes the EngC enjoyed were due in no small measure to its moiety of power expressed primarily in being able to confer the CEng title and to set standards. On these the EngC was able to hang many other initiatives. In the new situation this element of power remains with the EC(UK), though now attenuated by the new influence of the Institutions.

In contrast the ETB, although having the backing of Government, has to rely on voluntary co-operation by a number of national bodies who, whatever their goodwill, have their own priority objectives set by their financial providers. The ETB is also vulnerable to financial pressures – not least from the Engineering Institutions that have to be continually convinced that their members' money is being spent, if not to their direct benefit, then at least to the benefit of UK engineering and technology.

The ETB, therefore, needs early successes if it is to establish itself. And in a few years' time it will, no doubt, be judged on the progress made in its four priority areas, re-stated here for reference purposes:

Primary Objective 1 – Start the reversal in the downward trend in the supply of people with qualifications and skills relevant to engineering and technology based careers and jobs.

Primary Objective 2 – Achieve a marked and noticeable shift in public attitudes towards an understanding of the importance and value of engineering and technology in today's economy.

Primary Objective 3 – Build effective and valued links with business and industry reflecting its real time and future needs.

Primary Objective 4 – Review and maintain the professional standards required to meet industry's needs and maintain an authoritative register of appropriately qualified individuals.

What internal problems will need to be overcome to reach these Objectives, of which probably the most difficult to achieve are the first and second? The authors of this Chronicle suggest that the following are the most important factors – and criteria will need to be established to measure success in each of them.

- The '2 million' in the 'wider engineering and technology community' will need to be more clearly identified so that their opinions can be sought and their needs identified.

- Their value to the economy needs to be quantified and made clear to Government and the general public.

- The satisfaction and rewards of jobs and careers in the wider community, as well as in professional engineering, need to be promoted vigorously.

- The ETB will need to secure long-term funding from Government, commerce and industry for core and project purposes, in addition to the money contributed by professional engineering Registrants.

- Representative bodies such as the EEF, EMTA and RAEng will need to exhibit full-hearted co-operation with and through the ETB, even at some cost to their own agendas and prominence.

Towards the 'Engine for Change'

These five points and success in the four primary objectives will put to the test whether such a federation for a common purpose is a practical possibility. If it does succeed then, at long last, Monty Finniston's concept back in 1981 to create an 'Engine of Change' will have become a reality. In Sir Peter Williams as Chairman and Alan Clark as Chief Executive the ETB has got off to a good start having found eminent and perceptive leaders. They will surely carry forward Dr Hawley's vision in the interests of the UK. It is worth mentioning that he left them, as a legacy, a letter giving them his views on immediate necessary developments to carry the ETB forward.

Further Insights

Readers who may wish to glean further insights to the thinking behind the Hawley Review and the creation of the Engineering and Technology Board should refer to Michael Letellier's *The Rebirth of UK Engineering*, published by Training Publications Ltd in 2003. Appendix 4 of that publication gives the complete text of the letter that Dr Hawley wrote to Sir Peter Williams in December 2001.

Valete

At this stage, the writers of this Chronicle can only stand back and appreciate the efforts that have been made and, suppressing any scepticism about ETB's chances, extend every best wish for the success of the venture, the latest chapter in the evolving saga of the Engineering Profession's development through the sequence of {EIJC}/{CEI}/{EngC} and now the ETB plus the EC(UK).

Chapter 8

Verdict

A Synoptic View

With hindsight, what have the life and times of the EngC amounted to ?

The EngC came about, it will be recalled, as the 'Engine for Change' resulting from the Government's enquiry, the outcome of which was known as the Finniston Report.

It got off to a good start. There was a smooth take-over from the CEI in 1982 and the launch of the EngC was characterised by the first Council members' clear vision of its Charter responsibilities including the key phrase "..to advance education in, and to promote the science and practice of, engineering (including relevant technology) for the public benefit and thereby to promote industry and commerce in our United Kingdom". This reference about the benefit to the UK was not to be found in the charters of the Engineering Institutions whose primary duty was to their own disciplines and memberships.

The EngC rapidly established excellent relationships with government departments, industry, the press and the representative bodies of the higher education and schools sectors.

However, the relationship with the Engineering Institutions was not so comfortable, partly because of a perceived rivalry between their own sectoral activities and the EngC Charter, and also because the EngC Council members were appointed and sat as individuals, there being no Institution representatives. Nonetheless there was helpful co-operation in such areas as the development of education and training standards, the international promotion of UK qualifications and the collection of Registrants' fees.

The first few years were marked by a range of strong initiatives destined to develop steadily during the lifetime of the EngC and be associated with its name. These included (in no special order):

- The establishment of the computer-based Register of CEngs, IEngs and EngTechs holding nearly 300,000 names and addresses.
- Regular communication with Registrants including surveys of salaries and opinions.
- The Women Into Science and Engineering (WISE) programme reaching many thousands of schoolgirls and including several WISEMOBILES.
- The Young Engineer(s) for Britain (YEB) competition attracting entries from hundreds of schools annually.
- The Neighbourhood Engineers scheme which, by 1993, involved more than 11,000 engineers and 2,100 schools.
- The ECRO comprising 19 regional branches involving members of all Engineering Institutions over the whole of the UK, and the associated Annual Conference.
- Contact with industry via the Industry Affiliate scheme having over 200 members, mainly large companies, and annual Industry Conferences.
- The system of 'Nominated', 'Authorised' and, later, 'Licensed' Engineering Institutions for, *inter alia*, the accreditation of engineering education courses, the approval of training schemes, and the monitoring of their standards by the EngC.

- The defining of improved standards of engineering education and training through the publication *Standards and Routes to Registration* (SARTOR); also many associated efforts such as those expended on resources for engineering education and the Integrated Engineering Degree Programme.
- The 'Technology Enhancement Programme' supplying Design and Technology resources to more than 1,000 schools.
- The international promotion of UK engineering qualifications through the European Engineer (Eur Ing) title and the agreement known as the 'Washington Accord'.
- The significant contribution to debates on matters of national importance expressed through a range of meetings and publications on, for example, 'Schools' Curriculum', 'The Supply of Engineers', 'Continuing Professional Development', 'Risk Issues' and 'Appraising the Technical and Commercial Aspects of a Manufacturing Company'.

All these efforts, and many others of a more transitory nature, were backed by powerful press and other media campaigns all directed, as the occasion arose, to specialised audiences and to the general public.

In retrospect it is clear that a continuous increase in depth and breadth of EngC activity took place in the period from 1982 to 1995. The track record as a Chartered body could hardly have been improved during that period even if the EngC had been 'Statutory' as originally recommended by the Finniston Committee of Enquiry – and would still have been preferred by some.

In the event it turned out that the mid-nineties marked something of a high-water mark. The persistent difficulties in dealing with the Engineering Institutions (in itself perhaps a reflection of EngC success) sparked a 'unification exercise' to search for a *New Relationship.* The consequent Charter changes of January 1996 had profound effects. They resulted in the replacement of the EngC's Council, to which members were appointed, by a Senate, the majority of whose members were elected by a process dominated by the Institutions. In effect this gave the Institutions a new leverage on the EngC. The intended New Relationship failed to operate successfully for at least two reasons. First the Senate with 54 members was too large and unwieldy. Second the plan faltered whereby the Institutions were grouped into 'Colleges' that would be the "principal source of advice to the EngC". In the event these colleges were emasculated to the point where their only function was to facilitate elections to Senate.

Soon afterwards, at the instigation of the Institutions, an 'Activity Review' of the EngC was launched. The ostensible purpose was to ensure that the EngC undertook only those things best done at the centre. An unexceptionable objective on the face of it - but it resulted in a number of hitherto successful activities being terminated or hived off to the Institutions, sometimes with disastrous consequences. A prime example of this was the replacement of the centrally-run regional activity, the ECRO (EngC Regional Organisation) by the PEIs (Professional Engineering Institutions). In each of 15 PEI regions one named Institution was made responsible for organising activities in which the members of all Institutions could participate. In the event only two or three PEIs operated at all and then only in a limited way. The demise of the ECRO effectively terminated inter-Institutional regional co-operation.

None of this might have mattered if advantage had been taken of another development when in March 1997 the (Conservative) Government and the EngC arrived at the significant and wide-ranging 'Memorandum of Understanding'. This recognised the EngC as the body to

represent the engineering profession both in the UK and internationally. It also, for example, committed the Government to look to the EngC "…to offer advice on national issues such as education, training, industrial competitiveness, risk, the environment…where engineering is a major factor".

Unfortunately, nothing much came of this. Maybe because of the difficulties of developing the 'New Relationship' a sufficiently strong political will was absent in the EngC Senate, or else the importance of the MOU was insufficiently recognised.

Be that as it may, the whole future of the EngC was about to be overtaken by events. A fresh initiative, which we describe fully in Chapter 7, was launched in 1999 with a steer from a new (now Labour) Government Minister to 'add value to the wider engineering community'. There was a subtle change here from serving the *profession* to serving the *community.* After intensive, protracted and wide-ranging discussions the upshot, at the beginning of 2002, was the division of the EngC into two parts. One was the Engineering and Technology Board to develop the community idea – taking in some existing efforts such as Neighbourhood Engineers and Industry Affiliates. The other was, with a fresh Charter, the Engineering Council (UK) which was now confined to the regulation of the profession in the UK and its representation internationally.

Appraisal of 20 Years' Activity

So at the end of the day, can any objective judgement be passed on the success or otherwise of the Engineering Council from the granting of its Charter in November 1981 to its replacement in February 2002 by the ETB and the EC(UK)?

By the nature of things it is difficult to claim a one-to-one correlation between any particular activity of the EngC and a perceived improvement on the national scene - because it can always be argued that other, possibly more powerful, economic and cultural influences were at work. However, to take just one example, that of the WISE campaign, national data show that during the life of the EngC the proportion of women entering engineering degree courses rose from about 6% to more than 14%. Not all of this may be attributable to the efforts of the EngC, but it would be perverse to argue that none of it was, bearing in mind the evident success of the campaign on the ground.

Opinions of Contributors

To attempt an all-round assessment of the EngC's impact, questionnaires were circulated to current and previous EngC Council and Senate members, Directors-General and Directors, other EngC staff and Engineering Institutions. A number of personal interviews were also undertaken.

Two of the questions asked were:

1. What had been the EngC's 'Successes', 'Partial Successes' and 'Shortcomings'?
2. What should be its future priorities?

We provide below a summary representing the consensus of opinion in each case. Although the answers to the second question have largely been taken over by events, the responses may prove to be useful to the EngC's successors and other bodies.

Within each category the items are listed in no special order. They should be read in the context of the Engineering Council being established as a Chartered body rather than the Statutory Authority recommended by Finniston which, indeed, would have been preferred by many, though not all, of the subsequent participants in the EngC's affairs. More detailed views on various aspects will be found in Annexes H and I.

Successes

- The encouragement of women into engineering through WISE backed by media campaigns.
- The creation and implementation of Standards And Routes to Registration (SARTOR-1 and 2).
- Raised professional standards exemplified by the 'Competence and Commitment' document and the subsequent SARTOR-3.
- Establishment of Industry Affiliates.
- Nomination and audit of Institutions' policies and procedures.
- Regular surveys of the profession.
- Young Engineer(s) for Britain (YEB) – a high profile nationally and in the regions.
- Considerable media successes such as the publication of new Registrants' names in the *Daily Telegraph* and *The Times*.
- Certain EngC reports on national issues such as those on 'Risk', 'Environment' and 'Trading up your Technology'.
- The 'Washington Accord' on international recognition of accredited degrees.
- Take over and management of the Register of CEngs, IEngs and EngTechs.
- Neighbourhood Engineers.
- The "Ivanhoe" booklets on the engineering profession.
- The EC Regional Organisation, until replaced by the PEIs .

Partial Successes

- EngC Examinations – a good effort but could have been further developed.
- The introduction of Continuing Professional Development (CPD).
- Relations with Europe and FEANI.
- Some (but not enough) mergers of Institutions.
- Clear and inspiring goal and strategy.
- Better working relationships with and between the Institutions.
- Encouragement of greater recognition of Incorporated Engineers and Engineering Technicians.
- The publication *Engineering First.*
- Limited success towards 'Unification'.
- Some inroads in promoting the status of engineers and acting as the "voice of the profession".
- The publication 'Management and Business Skills for Engineers' – an excellent document, though not sufficiently exploited.
- The 1997 Memorandum of Understanding (MOU) with the Government – but insufficient follow-up.

Shortcomings

- Failure to establish Registration as an essential qualification for engineers.
- Lack of confidence in selling itself to the public.
- Misconception of the 'College' structure arising out of the Fairclough Initiative by which Colleges were unsatisfactory devices for dividing up the electorate rather than effective professional groupings of related engineering disciplines.
- Still far too many Engineering Institutions.
- No action to draw the attention of Government to the catastrophic decline of the UK manufacturing base.
- Institutions continuing not to trust or to match the changes promulgated by the EngC.
- Insufficient realisation that the EngC volunteers are the most valuable resource group for its survival.
- The importance (as distinct from the status) of the profession to the economy remains unrecognised.
- Huge swathes of industry to which the Engineering Council means nothing.

Suggested Future Actions

The suggested future actions for the EngC are given here. All were suggested more than once by different respondents. They merit consideration now by the ETB or the EC(UK) as appropriate: [Some editing has been carried out for consistency of presentation]

- Develop the prestige of the Register so that all who are qualified become registered.
- Promote closer relationships and partnerships between all engineering organisations.
- Pursue vigorously the cause of Incorporated Engineers and Engineering Technicians – and for women as well as men.
- Conduct a vigorous campaign to recruit more small and medium-sized enterprises to become Industry Affiliates.
- Establish in the public mind and the body politic the Engineer's historic and present role in advancing public health.
- Look at the impact of 'new' areas of engineering and take full account of the multi-disciplinary nature of engineering projects. The Institutions alone will not progress engineering as an entity.
- Embrace the new 'digital' economy where software, telecommunications, and e-business are now major employers of technical skills.
- Investigate the decline of our manufacturing industry and make recommendations.
- Stand up in full public glare for engineers and engineering in all aspects, not only in general but in detail, week-in and week-out.
- Simplify SARTOR. Introduce a modular approach to make it more easily understood.
- Promote and implement competence and standards for career progression – CPD, assessment and accreditation, licensing for specifically identified skills.
- Foster an independent enquiry into the roles of the Institutions and suggest possible amalgamations.
- Ensure the relationship with Government is enhanced and recognised as effective.
- Preach the excellence of the UK system of engineers' formation to overseas organisations.

What If …?

The successes and partial successes outlined above indicate, in the opinion of the authors of this Chronicle, a substantial and creditable contribution by the EngC to the national engineering scene and to the development of the engineering profession. But "What If…?"

What If..? Such a wealth of uncertainty is conjured up by that phrase. We extend every best wish to the ETB; but what if, in the later years of the EngC, as much effort as was put into the establishment of the ETB had, instead, been invested into the full implementation of the MOU and in reinforcing successful ventures, such as the ECRO, WISE, YEB, SARTOR, Neighbourhood Engineers and Industry Affiliates? Then who knows what benefits would have flowed to the profession, to engineering education and to industry in the United Kingdom.

We leave you with that thought**.**

Glossary of Terms

Accreditation Representatives (AcReps)	Forerunners (1982 –1996) of EngC Reps (qv), but having a lesser role.
Authorised Body (to 1995)	A Nominated Body (qv) authorised by the EngC to accredit academic courses, approve structured training schemes and arrangements for experience and assess non-standard qualifications. Satisfactory completion of such a course or programme entitles a candidate to entry in the Appropriate Section and Stage of the Register.
Chartered Engineering Institution	An Engineering Institution holding a Royal Charter whose full members are characterised by gaining a university degree and appropriate professional development in a relevant field.
Engineering Council Representatives (EngCReps)	Volunteer Registrants, acting on behalf of the Nomination and Audit Committee, to attend, at an Institution other than their own, specified meetings of membership and education/ accreditation committees.
Engineering Institution	An organisation comprising individual members whose collective principal aims include the advancement of any branch of engineering, and which carries out learned society activities.
Engineers' Mobility Forum	An extension of the Washington Accord (qv) for full mutual recognition of qualifications leading to national titles.
European Engineer (Eur Ing)	A pan-European title awarded by FEANI to qualified engineers of any of the Member States who satisfy the stated engineering/training standards.
Industry Affiliate	An employer voluntarily associated with the EngC among whose employees are professional engineers.
Institution Affiliated Body	A body recognised by the EngC as being Affiliated to a Nominated Body for the purpose of proposing its suitably qualified members to the Register.
Licensed Body (from 1995)	See Authorised Body.
Matching Section	An educational course making good an individual's deficiency for a Stage of the Register. Can take various forms depending upon the needs of the individual.

Neighbourhood Engineers	A scheme through which volunteer Registered Engineers co-operate with their local schools with advice and assistance on projects and design and technology.
Nominated Body	A body (usually an Engineering Institution) certified by the EngC to assess the competence, commitment and professional conduct of individuals, and hence their suitability for admission to the EngC's Register.
Nominations and Audit Committee	The EngC executive committee responsible for evaluating and recommending whether applicant bodies should be Licensed and, utilising the system of EngC Reps, ensuring compliance with the conditions of licensing.
Professional Affiliate	A professional engineering body (not necessarily comprising individual members) having a formal association with the EngC.
Professional Associate (discontinued in 1995)	A professional engineering body which cannot, or does not wish to, be Nominated or Institution-Affiliated but whose contribution to engineering is welcomed by the EngC.
Register, The	The EngC listing of names and addresses of individuals who have satisfied the requirements of registration.
Register, Sections of the	There are three Sections of the Register: Chartered Engineer (CEng) Incorporated Engineer (IEng) Engineering Technician (EngTech)
Register, Stages of the	For each Section of the Register there are three Stages: Stage 1 – Satisfactory Education Stage 2 – Satisfactory Training Stage 3 – Satisfactory Experience
Registrant	An individual listed on a Section and Stage of the EngC Register.
Washington Accord	An international agreement whereby a graduate from an accredited engineering degree course in one of the participating countries is recognised in all the other countries as possessing an academic qualification equal to their own accredited engineering degrees.

Annex A

Members of the Finniston Committee

Sir Montague Finniston FRS, FRSE, BSc, PhD, FRSA, FIM, FInstP, FIChemE, FBIM
Lately Chairman, Sears Engineering Ltd.

Miss Catherine Avene OBE, MA
Careers Guidance Inspector, Inner London Education Authority.

William E Buckley BSc(Eng), MEd, CEng, FIMechE, MBIM
Director of North Cheshire College.

Thomas J Crispin
National Secretary, Power and Engineering Trades Group, Transport and General Workers Union.

Herbert Darnell OBE MEng, CEng, MIEE
Director, Special Duties, British Steel Corporation.

James H Dawes TEng, FIPlantE
Lately Divisional Controller, Rolls-Royce Ltd.

Dr Frank Dickenson BSc(Eng), PhD, CEng, FIMechE
Director of the North Staffordshire Polytechnic.

Professor John H Horlock FRS, FEng, MA, PhD, ScD, FIMechE, FRAeS
Vice-Chancellor and Professor of Engineering, University of Salford.

Lord Howie of Troon BSc, CEng, MICE
General Manager of 'New Civil Engineer' and other Thomas Telford Ltd magazines.

Dr Bryan C Lindley BSc(Eng), PhD, FIMechE, FIEE, FInstP
Director of Research, Dunlop Ltd, previously Managing Director of ERA Technology Ltd.

William McCall
General Secretary of the Institution of Professional Civil Servants.

Sir James Menter FRS, MA, PhD, ScD, FInstP, FRSA
Principal of Queen Mary College, University of London.

Major-General Hugh Macdonald-Smith CB BSc, CEng, FIMechE, FIEE
Secretary to Council, Telecommunications Engineering and Manufacturing Association, previously Director of Electrical and Mechanical Engineering, Ministry of Defence.

Henry R G Nelson MA, CEng, MIEE
Director and General Manager, RHP Automotive Bearings Division.

Dr John A Powell MA, DPhil, CEng, FIEE, FRSE, SMIEEE, FBIM, FRSA
Lately Vice-Chairman EMI Ltd

Mrs Elizabeth M Sadler MA, CEng, MICE
Consultant Civil Engineer with the Ove Arup Partnership

Professor David Weir MA, DipPSA, MBIM
Dean of the Scottish Business School, Glasgow, Professor of Organisational Behaviour, University of Glasgow.

Mrs Jean B Wilson BSc
Adviser on Mathematics to the Tayside Region

Annex B

First Members of the Engineering Council and Senior Staff, 1982/83

Sir Kenneth Corfield FEng
Chairman and Chief Executive, Standard Telephones and Cables plc

Professor Gordon Beveridge BSc, ARCST, PhD, CEng, FIChemE, FRSE
Head of Department of Chemical and Process Engineering, University of Strathclyde

Viscount Caldecote DSC, MA, FEng, FIMechE, FIEE, MRINA
Chairman, Finance for Industry, President, Fellowship of Engineering.

Geoffrey Drain CBE JP, BA, LLB
General Secretary, National and Local Government Officers Association.

Professor Derek Embrey CEng, FIEE, FIERE, MIGasE
Executive Technical Director, AB Electronic Products Group plc, Visiting Industrial Professor, Loughborough University.

John Fairclough BSc(Tech), CEng, FBCS, FIEE, ScD
Director Manufacturing and Development IBM United Kingdom Ltd, Chairman IBM United Kingdom Laboratories Ltd.

Sir Alistair Frame MA, BSc, FEng, FIMechE
Deputy Chairman, Rio Tinto-Zinc Corporation, Director, Plessey Company Ltd, Director Vickers Ltd, Director Toronto Dominion Bank.

Geoffrey Hall BSc, FEng, SFInstE, FRSC
Director, Brighton Polytechnic, Member, Council for National Academic Awards, Member, Science and Engineering Research Council.

Professor Sir Alan Harris CBE FEng, BSc(Eng), FICE, FIStructE, MConsE
Partners, Harris & Sutherland Consulting Engineers, lately Professor of Concrete Structures, Imperial College of Science and Technology.

Michael Harrison CBE MA, FBIM
Chief Education Officer, City of Sheffield, Member, Technician Education Council, Deputy Chairman, Standing Conference on Schools Science and Technology.

Ronald Hooker CEng, FIProdE, CBIM
Chairman, Henry Sykes Ltd, Chairman Dubilier plc, Chairman, James Austin Holdings plc, Member of Management Board, Engineering Employers Federation, Deputy Chairman, UKO Int plc, Director, Hambros Industrial Management Ltd, Industrial Advisor to Hambros Bank.

Dr John Horlock MA, PhD, ScD, FRS, FEng, FIMechE, FRAeS, FASME
Vice-Chancellor, Open University, Director, BL Technology Ltd, Director, British Engine Insurance Ltd.

John Lyons BA, FRSA
General Secretary, Engineers' and Managers' Association and Electrical Power Engineers' Association, Member, British Telecom Board

Peter Martin CBE, CEng, FIMechE, FInstE, FCIBS, AMRAeS, MConsE
Partner, Oscar Faber & Partners, Consulting Engineers.

Baroness Platt of Writtle CBE, MA, CEng, MRAeS
Vice-Chairman, Essex County Council, Chairman (designate) Equal Opportunities Commission.

David Plastow
Managing Director and Chief Executive, Vickers Ltd, Member, British Overseas Trade Board, Director, Guest Keen & Nettlefold plc.

Ralph Quartano BSc, CEng, MIChemE
Chief Executive, Post Office Staff Superannuation Fund, Member of Board, Britoil

Derek Roberts BSc, FRS, FEng, MIEE, FInstP, MIEEE
Director of Research, The General Electric Company Ltd

Senior Staff

Dr K A G Miller MA, PhD, FEng, FIMechE
Director-General

Mr J H Carlill OBE
Secretary (from February 1983)

Mr G G Anthony BSc, CEng, FIMechE
Director - Industry (from May 1983).

Mr A E J Bond CEng, FRSA
Director - Education and Training.

Mr R P Kirby MIPR
Director - Public Affairs (from May 1983).

Professor J C Levy BSc(Eng), MS, PhD, CEng, FIMechE, MRAeS, ACGI
Director - Professional Institutions (from June 1983).

Standing Committee on Education and Training

Chairman	Mr G R Hall
Members	Mr G M A Harrison
	Mr R G Hooker
	Mr P L Martin
	Baroness Platt

Standing Committee on Industry

Chairman Mr G Drain

Members Viscount Caldecote
Professor D M Embrey
Mr D A S Plastow
Mr R N Quartano

Standing Committee on Professional Institutions

Chairman Professor G S G Beveridge

Members Sir Alistair Frame
Mr J Lyons
Mr P L Martin

Ad Hoc Committee on Technology and Product Design

Chairman Mr D H Roberts

Members Mr J Fairclough
Professor Sir Alan Harris
Dr J H Horlock

Members from outside The Engineering Council
Professor E A Ash, University College, London
Mr J F Coplin, Rolls-Royce Ltd
Mr D E Filer, Imperial Chemical Industries plc
Mr P S Godfrey, Halcrow-Ewbank Petroleum and Offshore Eng Co
Mr C S King, BL Technology Ltd
Professor P J Lawrenson, University of Leeds
Mr D E Neale, May Gurney & Co Ltd
Mr R B Nicholson, Cabinet Office
Mr D T Shore, APV Holdings plc

Finance and General Purposes Committee

Chairman Mr R N Quartano

Member Mr R G Hooker

Annex C

Original Policy Statement (shortened)

Aims

The performance of engineering in the United Kingdom is paramount to the nation's future industrial, economic and social prosperity. The revenue earned from the products we make, the services we supply and the business we generate, relies extensively on the quality of our engineering expertise and the development of our manufacturing capability.

It is against this background and in response to the recommendations in the Report of the Finniston Committee of Inquiry into the Engineering Profession, that The Engineering Council was established under Royal Charter. The principal aim of The Council is to advance education in, and to promote the science and practice of, engineering for the nation's benefit and to promote industry and commerce in the United Kingdom.

The Council acknowledges that its primary objective is to encourage and improve the efficiency and competitiveness of British industry and commerce. It has taken its Charter as the basis for its activities. The Council is also aware of the long term nature of much of its work and had taken note of this in setting its priorities.

To meet the needs of industry, The Council will interact with and consult relevant organisations including (a) The Fellowship of Engineering, (b) the Professional Engineering Institutions, (c) companies in industry, financial institutions and trade associations, (d) Government Departments, (e) educational establishments and research organisations, and other bodies such as the National Economic Development Office (NEDO), the Manpower Services Commission (MSC) and the Engineering Industry Training Board (EITB).

People

The Council seeks to achieve a proper balance between engineering and other related activities in an enterprise and to promote a better understanding by management of the place of the engineer. In turn The Council will use its influence to ensure that engineers have a wider appreciation of the business aspects of the enterprise and are trained and equipped to manage.

The educational phase of an engineer's development calls for greater injection and integration of relevant practical experience into courses. This in turn requires a more positive response from industry to provide more industrial training places. Success in design, development and manufacture requires engineers with expertise in more than one discipline.

Engineering Education

It is The Council's intention to promote a higher standard of technological literacy within the education system and to engender a better understanding of the contribution that engineering makes to the life and prosperity of the nation. The Council is determined to encourage the development and teaching of mathematics, science and technology in schools in a way which

is relevant to the needs of society, industry and the engineering profession. It is, however, important that this education must not be narrow. The country needs engineers who are literate, articulate and widely educated.

The Council will seek to influence those responsible for offering careers advice in schools and will examine what is being done to investigate young people's attitudes to careers in engineering and will encourage further research into this subject. In seeking to achieve this, The Council recognises the closer integration which must be achieved between the curriculum and careers education. In line with the Finniston recommendations The Council is keen that more girls should be persuaded to take up a career in engineering and will seek ways of assisting those who desire to enter the profession.

The Council intends to give special consideration to the engineering and training of Technician Engineers and Engineering Technicians in recognition of the valuable contribution they make to industrial performance. There is already considerable concern that there is a shortage of technicians in some parts of industry.

The Register

The Register of The Council will be computer based and will have separate categories for Chartered Engineers, Technician Engineers and Engineering Technicians: each category will identify the three stages of career development which are set down in the Charter. It will be capable of assimilating the present Engineers Registration Board data, but will hold greater information including addresses for those in each category.

The Council will work through nominated institutions in matters concerning accreditation of courses, training programmes and experience leading to registration of individuals. Nomination standards will be set and published by The Council and institutions will be assessed prior to acceptance as nominated institutions. The Council does not intend to set any arbitrary limits to the number of institutions which can be nominated.

In addition to taking over the registration of the profession, The Council will wish to establish an examination process equivalent to the present CEI system, through which candidates without an accredited degree may progress to Chartered status.

The Council having been given the responsibility of creating its own Register of Engineers, one of the main aims of The Council is to secure a much better understanding in industry of the value to it of employing Registered Engineers, Technician Engineers and Engineering Technicians. This will take time but it is an essential long term objective.

Continuing Education and Training

The Council recognises the accelerating pace of technological change and the effect this is having upon the engineering industry. To ensure that industry remains competitive, it is essential to provide continuing education throughout an engineer's working life, both in the technological and wider business senses. While much of the responsibility for this task falls on industry itself, there is a significant contribution from higher education establishments, the professional institutions and the Open University.

Engineering Assembly

The Engineering Council is giving consideration to the possibility of an engineering assembly which would meet periodically to debate matters of interest and concern to the profession, and to make recommendations to The Engineering Council. Membership of this assembly would be on the basis of elected representation.

The Council Membership

The Charter of The Engineering Council states that for the period of three years, the first Chairman and up to 24 members will be appointed by the Secretary of State for Industry. Thereafter the Chairman and members will be selected by The Council from a list. It is envisaged that when a steady state is reached, each member will be appointed for a three year period, with approximately eight new appointments or re-appointments per annum. The bodies which will be asked to put forward names for the list will be:

1. Nominated Chartered Engineering Institutions.
2. Organisations of employers.
3. Education establishments.

In making the selection, the Charter specifies that the Chairman and at least two-thirds of the other members shall be Chartered Engineers and that at least one half of the members shall have experience as employers or as managers of practising engineers and of engineering technicians.

Funding of The Engineering Council

It is the intention of The Council that the Secretariat will be small and of high quality staff and that it will work through, and with, other appropriate organisations. The cost will be limited to the overheads associated with a Secretariat limited on present assessments to 25-30 people. For the first three years it is being funded by a grant-in-aid from the Government. Thereafter it will look to the Professional Institutions, Government and possibly industry for its funding on the basis that each sector has a responsibility to assist The Council in its objective of raising the performance of engineering and engineers for the nation's benefit. It would not expect to receive more than half its funding from any one of the three sources.
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Annex D

Initial List of Nominated Bodies

In accordance with Article 5 of the EngC's Royal Charter and Bye-Law 40, the following were the initial Nominated Bodies. The Groupings shown are those of the EngC's Executive Group Committees.

Group 1

The Institution of Mechanical Engineers
The Institution of Production Engineers
The Bureau of Engineer Surveyors
The Institute of Engineers and Technicians
The Institution of Engineering Designers
The Institution of Mechanical and General Technician Engineers
The Institution of Technician Engineers in Mechanical Engineering

Group 2

The Institution of Civil Engineers
The Institution of Municipal Engineers
The Institution of Structural Engineers
The Association of Water Officers
The Chartered Institution of Building Services
The Highway and Traffic Technicians Association
The Institute of Hospital Engineering
The Institute of Plumbing
The Institution of Agricultural Engineers
The Institution of Highways and Transportation
The Institution of Public Health Engineers
The Institution of Works and Highways Management
The Society of Civil Engineering Technicians

Group 3

The Institution of Electrical Engineers
The Institution of Electronic and Radio Engineers
The Biological Engineering Society
The Institution of Electrical and Electronics Incorporated Engineers
The Institution of Public Lighting Engineers
The Institution of Railway Signal Engineers
The Society of Electronic and Radio Technicians

Group 4

The Institution of Chemical Engineers
The Institute of Energy
The Institution of Gas Engineers
The Institution of Metallurgists
The Institution of Mining Engineers
The Institution of Mining and Metallurgy
The British Institute of Non-Destructive Testing
The Institute of Measurement and Control
The Institute of Metallurgical Technicians
The Institute of Quality Assurance
The Institute of Sheet Metal Engineering
The Institution of Mining Electrical and Mining Mechanical Engineers
The Institution of Nuclear Engineers
The Institution of Plant Engineers
The Minerals Engineering Society
The Society of X-Ray Technology
The Welding Institute

Group 5

The Royal Aeronautical Society
The Institute of Marine Engineers
The Royal Institution of Naval Architects
The Institute of Automotive Engineer Assessors
The Institute of the Motor Industry
The Institute of Road Transport Engineers
The Institution of Engineers and Shipbuilders in Scotland
The North East Coast Institution of Engineers and Shipbuilders
The Society of Licensed Aircraft Engineers and Technologists

Annex E

Aims & Objectives of the Engineering Council, 1988

Aims

The Engineering Council's aims are to develop and promote, for the public good and the well-being of the national economy, all aspects of engineering by:

• Increasing awareness of the essential and beneficial part engineering plays in all aspects of modern life.

• Spreading best engineering practices to improve the efficiency and competitiveness of UK businesses.

• Stimulating and leading discussions aimed at reaching decisions on the standards of education, training, re-training and experience necessary to meet defined engineering competence criteria.

• Advancing engineering knowledge through education and training.

• Ensuring, by direct action and encouragement, a sufficient supply of Registered Chartered and Incorporated Engineers and Engineering Technicians.

• Co-operating with and where appropriate co-ordinating the work of any organisations, groups or individuals whose activities have an engineering dimension.

Objectives

The Engineering Council seeks to achieve the above aims by:

• Advising, and when necessary lobbying, the Government, in conjunction with public and private sector representatives, on the national level policies, actions and resources essential to ensure the proper supply and quality of qualified engineers and technicians.

• Promoting, maintaining and expanding the Register of Chartered Engineers, Incorporated Engineers and Engineering Technicians as the recognised hallmark of achieved standards.

• Encouraging Chartered Engineers, Incorporated Engineers and Engineering Technicians to take part in the United Kingdom's affairs at a national level and to promote, specifically with employers, the recognition of their value and contribution.

• Generating strong and effective links between education and industry so that children, parents and teachers are aware of the benefits of a career in engineering to individuals and the country.

• Demonstrating the need to make best use of existing and new technology together with product design.

• Seeking to optimise the benefits of European integration through discussions with industry, learned societies, the professional Institutions and Government.

• Utilising the Engineering Council's national network to the full in order to spread 'The Engineering Message'.

• Promoting, among employers and employees, the benefits of continuing education, training and re-training not only in the basic engineering disciplines but, increasingly, in managerial and linguistic skills.

• Highlighting engineering careers for women and seeking means to retain and maximise their skills and experience beyond any career break, through the Women Into Science and Engineering (WISE) campaign.

• Encouraging fresh approaches to educational courses and training programmes with particular emphasis on interdisciplinary aspects.

• Concentrating professional engineering resources and so strengthening their influence, by developing co-operation between institutions.

• Encouraging timely and advantageous Institutional mergers.

• Stressing the need for a proper balance between efficiency, public safety and the needs of the environment when carrying out engineering activities.

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Annex F

The Engineering Council College Structure

COLLEGE A INSTITUTIONS	COLLEGE B INSTITUTIONS	COLLEGE C INSTITUTIONS	COLLEGE D INSTITUTIONS
The Institution of Civil Engineers	The Institution of Mechanical Engineers	The Institution of Electrical Engineers	The Institution of Chemical Engineers
The Chartered Institute of Building Services Engineers	The Institute of Materials	The Institution of Electronics and Electrical Incorporated Engineers	The British Computer Society
The Institution of Structural Engineers	The Institution of Mechanical Incorporated Engineers	The Institution of Physics and Engineering in Medicine and Biology	The Institute of Marine Engineers
The Institution of Agricultural Engineers	The Institute of Acoustics	The Institution of Incorporated Executive Engineers	The Royal Aeronautical Society
The Institute of Highway Incorporated Engineers	The Institution of Engineering Designers	The Institute of Physics	The Institute of Energy
The Institute of Healthcare Engineering and Estate Management	The Institute of Engineers and Technicians		The Institution of Gas Engineers
The Institution of Nuclear Engineers			The Institute of Measurement and Control
The Institute of Plumbing			The Institute of Mining Engineers
The Chartered Institution of Water and Environmental Management			The Institution of Mining and Metallurgy
The Institution of Water Officers			The Association of Cost Engineers
			The Institute of British Foundrymen
			The British Institute of Non-Destructive Testing
			The Institution of Plant Engineers
			The Institution of Quality Assurance
			The Welding Institute
			The Royal Institution of Naval Architects
			The Institute of Road Transport Engineers
			Direct Registrants

Note: Individuals who were Registrants of the Engineering Council and whose registration was effected through the Institutions shown below (which were not Nominated Bodies at that time) were entitled to vote in the election in the colleges shown, but Registrant-nominated candidates could not use members of these Institutions to support their nominations.

	COLLEGE B INSTITUTIONS (NOT CURRENT)		COLLEGE D INSTITUTIONS (NOT CURRENT)
	The Institute of Sheet Metal Engineering		The Institute of Automotive Engineer Assessors
	The Minerals Engineering Society		
Number of Registrants	**Seats**	**Number of Registrants**	**Seats**
6,000 to 21,999	1 seat	54,000 to 69,999	4 seats
22,000 to 37,999	2 seats	70,000 or more	5 seats
38,000 to 53,999	3 seats		

This formula provided a distribution of Institution seats across the four colleges as follows:

COLLEGE A	**COLLEGE B**	**COLLEGE C**	**COLLEGE D**
ICE (47,597) 3 seats	IMechE (46,824) 3 seats	IEE (57,074) 4 seats	IMarE (12,900) 1 seat
IStructE (13,042) 1 seat	IMat (6,572) 1 seat	IEEIE (19,038) and other Incorporated Institutions currently in EGC3 (2,632) 2 seats	RAeS (9,407) 1 seat
CIBSE (7,244) 1 seat	IMechIE (6,524) 1 seat		IChemE (8,958) 1 seat
Other Incorporated Institutions currently in EGC2 (9,371) 1 seat	Other Incorporated Institutions currently in EGC1 (7,349) 1 seat		BCS (6,401) 1 seat
			Other Chartered and Incorporated Institutions (29,789) 2 seats
TOTAL (77,254) 6 seats	TOTAL (67,269) 6 seats	TOTAL (78,744) 6 seats	TOTAL (67,455) 6 seats

TOTAL = 290,722* ∴ Mean = 72,680 Mean ± 2% of all Registrants giving a range of 66,866 to 78,495

Footnote: * excludes the Hong Kong Institute of Engineers (3,755) whose Registrants were not involved in the elections; and Registrants in the North East Coast Institution of Engineers and Shipbuilders, the Institution of Highways and Transportation, the Institute of Automotive Engineer Assessors, the Institute of Sheet Metal Engineers, and the Minerals Engineering Society, as they were not Nominated Bodies, and DIRECT (total 944), none of whom were part of the EGC structure. These Registrants needed to be included in Registrant elections.

The formula produced the following distribution across the Institutions:

The 3 largest Institutions (IEE + ICE + IMechE) with 52% of the total Registrants = 10 seats.
The 9 medium-sized Institutions (CIBSE + IStructE + IMat + IMechIE + IEEIE + IChemE + BCS + IMarE + RAeS) with 31% of the total registrants = 10 seats.
The small Institutions with 17% of the total registrants = 4 seats.

Annex G

MEMORANDUM OF UNDERSTANDING BETWEEN THE UNITED KINGDOM GOVERNMENT AND THE ENGINEERING COUNCIL

The United Kingdom Government and the Engineering Council make the following Memorandum of Understanding which records their joint commitment to enhance, strengthen and maintain a world class professionally qualified engineering workforce in the United Kingdom and their intentions in this regard. This Memorandum recognises that the Engineering Council is the national representative body of the Engineering Profession incorporated as a body corporate by a Royal Charter and Bye-laws granted in 1981, as supplemented in 1988, 1992 and 1995. It acknowledges that the Occupational Standards Council for Engineering and several Industry Training Organisations/ National Training Organisations (ITOs/NTOs) also play leading roles in training and determining standards for the engineering workforce. The Government and the Engineering Council shall use their best endeavours to realise the objectives of this Memorandum. It is not intended to create any binding legal obligations between the parties.

Article 1
(Royal Charter)

(1) The Government will use all appropriate means to support and foster the achievement by the Engineering Council of the objects for which it was constituted by Royal Charter, that is to advance education in, and to promote the science and practice of, engineering (including relevant technology) for the public benefit and thereby to promote industry and commerce in the United Kingdom.

(2) The Engineering Council shall be responsible for regulating the Engineering Profession and in collaboration with the Engineering Institutions and other engineering bodies shall publish and operate a code of conduct and disciplinary procedures.

(3) It is recognised that a primary means of regulating professional practice within the Engineering Profession in the United Kingdom is through membership of the professional Engineering Institutions and through registration with the Engineering Council. As the basis for such regulation, the Engineering Council shall maintain a register of qualified engineers (CEng) (lEng) (Eng Tech) as required by its Royal Charter and references in this Memorandum to the Engineering Profession shall be construed as references collectively to those so registered. It is noted that the term engineering profession is used in a wider or different context by other fora within the United Kingdom engineering community.

(4) The Council shall aim for full participation on the Register of all engineers and engineering technicians practising in the United Kingdom. The Council shall, in association with all employers of engineers, encourage the use of the Register as the standard for competent professional practice.

Article 2
(Government recognition)

(1) The Government acknowledges and endorses the essential role of the Engineering Council in representing the collective commitment of the Engineering Council, the Engineering Institutions and the engineers and technicians on its register constituent members' collective commitment to maintaining the highest standards of engineering expertise for the benefit of the community.

(2) Accordingly, the Government will look to the Engineering Council, amongst others, to offer advice, where appropriate, on national issues such as education, training, industrial competitiveness, risk, the environment and others where engineering is a major factor, with a view to ensuring education and training issues that the national education and training policy has a sufficient quality supply of the most talented people at every level of the engineering workforce to meet the expected skills needs of employers.

(3) It is noted that the Government has supported the establishment of a national network of Industry Training Organisations/National Training Organisations ITOs/NTOs for all industry sectors, including the engineering sectors, and that consultations by the Government with these and other employer-led engineering bodies will also, from time to time, be appropriate.

Article 3
(Government support in international organisations)

(1) The Government recognises the Engineering Council as the United Kingdom member of the World Federation of Engineering Organisations (WFEO), the European Federation of National Engineering Associations (FEANI), the European Higher Engineering and Technical Professionals' Association (EurETA), the Commonwealth Engineers' Council (CEC) and the Washington Accord. The Engineering Council will keep the Government informed of developments in these organisations. The Engineering Council is the Government's designated authority for the implementation of the two European General Systems Directives for mutual recognition of professional qualifications with regard to the Engineering Profession in the United Kingdom. The Engineering Council shall make periodic progress reports to the Government on the implementation of these Directives.

(2) The Government will support the Engineering Council in its efforts to engage actively in education and training policy with other countries through European and other international organisations, international agreements and other arrangements in the interest of promoting the mutual recognition of qualifications and the United Kingdom's trade and industry. The Engineering Council shall keep the Government informed of developments in these matters.

(3) In respect of matters falling within the scope of the Royal Charter, the Government will keep the Engineering Council informed of any intergovernmental discussions which may have an impact on the Engineering Profession or associated technical regulations, unless there are reasons of confidentiality for not doing so. It will invite, amongst others, the Engineering Council where appropriate to participate in such discussions, especially those which may lead to intergovernmental agreements concerning the Engineering Profession, and will fully take into account the Engineering Council's views on the best means of implementing such agreements. This applies with particular regard to the European Union and its programme for the elimination of barriers to employment and trade.

Article 4
(Co-operation and co-ordination)

(1) In furtherance of its objects and taking into account obligations arising from its Royal Charter the Engineering Council shall:

a. Work in partnership with the Engineering Institutions, the other Engineering related Learned Societies, the Royal Academy of Engineering, relevant National Training Organisations, engineering employers and persons whose functions or activities relate to engineering.
b. Act as the principal point of contact for matters relating to the Engineering Profession.
c. Co-ordinate and, at least in dealings with the Government and international organisations as appropriate, be the principal representative of the views of the Engineering Profession.
d. Seek to be recognised as the authoritative voice of the Engineering Profession, especially within industry and the media, and project a unified, influential image of the profession.
e. Establish close co-operation with employer organisations, the engineering trade associations, the relevant Industry Training Organisations/National Training Organisations ITOs/NTOs and other training bodies so as to facilitate advancement, through clearly defined routes, define clear routes for advancement of the engineering workforce.
f. Establish close links with the Royal Academy of Engineering, the Careers Services, Training and Enterprise Councils/Local Enterprise Companies, the Engineering Employers Federation, Scottish Enterprise, the Training and Employment Agency in Northern Ireland, the Engineering and Marine Training Authority and the relevant Occupational Standards Councils as well as Industry Training Organisations/National Training Organisations (ITOs/NTOs), to promote the Engineering Profession in schools/educational establishments and best practice in employment and continuous professional development of the engineering workforce, using whenever possible Government supported vehicles such as SETNET.

Article 5
(Standards, selection, education and training)

(1) In partnership with the Engineering Institutions and in collaboration with the CBI, the Engineering Employers Federation, Scottish Engineering, the Engineering Institutions, the Engineering and Marine Training Authority, the Occupational Standards Council for Engineering, Investors in People UK, the Management Charter Initiative and the education and training representative bodies and establishments the Engineering Council shall participate in establishing and regularly updating rigorous standards and criteria. These will include for the selection, education, training and continuing development of all levels of engineers and technicians the engineering workforce in the United Kingdom so as to contribute to enhancing, strengthening and maintaining a world class engineering workforce with the latest skills to enable firms to compete in the United Kingdom and the international markets.

(2) In collaboration with other engineering bodies, the Engineering Council shall maintain up to date detailed knowledge of developments in selection, education, training and employment of the Engineering Profession in the most competitive countries in the world and take the lead

in promoting beneficial change, best practice, quality and competitiveness in the United Kingdom.

Article 6
(Promotion of the profession)

(1) In collaboration with other United Kingdom bodies and Government supported initiatives, the Engineering Council shall promote the wider recognition by the public of engineering as a desirable preferred career option. The Engineering Council, working in collaboration with employers and other organisations, shall encourage the most able people to pursue careers in engineering and to retain them.

(2) The Engineering Council shall work with others to raise the standing of the Engineering Profession with employers, top management, the City, opinion formers, the media and the wider public.

Article *7*
(Encouraging participation)

(1) The Engineering Council shall encourage especially all levels of academia, industry, management and individuals, particularly young engineers, technicians, UK industry and management to participate actively in the better development and use of engineering skills to improve United Kingdom competitiveness. It shall seek to demonstrate that the Engineering Institutions are of conspicuous value to engineers and technicians at all stages of their careers and to the success of businesses. It shall encourage and assist individuals to assume responsibility for their own continuing professional development and put in place a framework for pursuing lifelong learning.

Article 8
(Promotion of United Kingdom professional quahfications overseas)

(1) In collaboration with other engineering bodies the Engineering Council shall promote the wider recognition of United Kingdom engineering occupational standards and professional qualifications in countries overseas with a view to giving United Kingdom firms a competitive edge in international markets.

Article 9
(Duration of MOU)

(1) This Memorandum comes into effect on the date of signing and remains in being unless amended by agreement or terminated by either party following consultation with the other after giving notice of such intention at least one month prior to commencement of consultations.

Ian Lang
President of the Board of Trade
(on behalf of the United Kingdom Government)

Alan Rudge CBE
Chairman of the Senate
(on behalf of the Engineering Council)

Tuesday 25 March 1997

Annex H

The Institutions' Viewpoints

Many times in this Chronicle we have made mention of the central but sometimes difficult relationship between the Engineering Council and the Engineering Institutions in their capacities of Nominated or Licensed Bodies.

On occasions, the Institutions have been portrayed, justly or unjustly, as not co-operating and self-centred; some have allegedly "talked down" the Engineering Council, resenting the central role that the EngC's Charter enjoined it to occupy. Even words such as "arrogant" and "intransigent" have been used to describe certain Institutions. From time to time it has been remarked on that some Institution Secretaries or Chief Executives, either deliberately or inadvertently, did not brief their incoming Presidents on the appropriate relationship and the successful activities of the EngC. On the other hand, there has often been good co-operation between the Engineering Council and the Engineering Institutions, for example on the question of professional qualifications and the collection of Registration fees.

Since such polarised remarks have been expressed sincerely by groups and individuals, it is worth ensuring that all sides of the picture are given an airing in this Annex.

All Institutions were circulated with a letter and questionnaire inviting them to contribute to this Chronicle. Thirteen replied at length, including four of the five with the largest memberships. What follows are representative replies under the headings suggested in the questionnaire.

Inevitably, with the changes brought about by the Hawley Initiative [see in Chapter 7], some of these observations have been overtaken by events. Nevertheless they are included here for the sake of the record of the profession.

Within each section those contributions that are starred thus * express a broad consensus view.

What has been your contact/Iivolvement with the Engineering Council?

*Association of Cost Engineers**

As there was a realisation that the bulk of the members of the Association were at the level of Incorporated Engineer, and following the success of the registration of Chartered Engineers, the Association applied to become Nominated and Licensed, under the revised arrangements, to be able to register both Chartered and Incorporated Engineers. This required a further audit, which was undertaken in September 1998 and resulted in the Association being Nominated and Licensed to register both Chartered and Incorporated Engineers. Standard case Chartered Engineers were permitted to be registered by the Association on its own. All other Chartered Engineer cases and Incorporated Engineer registrations were undertaken through the medium of bi-lateral agreements with the Institution of Chemical Engineers for Chartered Engineers and the Institution of Incorporated Engineers for the registration of Incorporated Engineers. This latter is a conditional licence until a track record has been achieved.

Throughout this period close links have been established, both formally and informally, with the Membership Department of the Engineering Council and also with the Membership Departments of the IChemE and the IIE. This has in general been with the Chairman and Secretary of the Engineering Committee. However, two members of the Engineering Committee have acted as Engineering Council Representatives with other Engineering Institutions. Additionally, of course, there has been an Engineering Council Representative who has attended meetings of the Engineering Committee, Professional Review Interviews and the audits of the Association by the Audit Panel of the Engineering Council.

Institution of Gas Engineers

As a founder member of the Engineering Council, IGasE has been closely and actively involved in the development of the Council's role. The relationship has been amicable and businesslike which has culminated in most members who were/are eligible to register with the Council doing so.

Ongoing contact with the Council at all levels ensures mutual understanding and involvement. IGasE embraces the EngCReps' concept and has a positive attitude to transparency of operations in-line with the confidence of ISO 9002 accreditation.

Institute of Marine Engineers

Everyone had high hopes that the Engineering Council would be more successful than the CEI in representing the profession and there were some successes. The Register was properly established, and the smaller Institutions had improved representation, international agreements were established, and all Institutions had a bigger say in how the profession could and did develop.

However, it was not the best solution and eventually a new structure came into being in the late nineties which was more democratic. Institutions were once more responsible for much of the work involved in assessing and registering prospective members. However, the price paid was higher standards.

Any comment on the Institution's relationship with the Engineering Council

*Institution of Incorporated Engineers**

The IIE is supportive of the Engineering Council and its mission as the lead body for the engineering profession, acting in partnership with the professional engineering Institutions to regulate and promote the profession in order to maintain a world class engineering force in the UK.

In what respects is the relationship good?

IIE firmly believes in co-operating with the Engineering Council to drive forward the interests of the profession. There has been significant work done by the Engineering Council to attempt to enhance the status and position of the Incorporated Engineer, and we have been very pleased with the attempts by the Engineering Council to ensure that it remains focussed on its core activities.

In what respects is the relationship Poor?

Not surprisingly, given the balance of the Registrants, it is still dominated by many Chartered Engineer interests which prevent it from successfully rebalancing the Register and so driving up Registrant numbers across the board, especially in the Incorporated Engineer and Engineering Technician sections of the Register.

Compared with five years ago, is the relationship better, about the same, or worse?

Institution of Electrical Engineers

Relationship between the IEE and the Engineering Council:

IEE has constantly tried to support the Engineering Council, although its interests and those of the Council have, on occasion, appeared to diverge.

Relationship has been good in that:

(a) Alan Rudge, Brian Manley and John Williams put in a tremendous amount of work in drafting the various documents and underpinning the relaunch of the Engineering Council in 1996.
(b) There has been considerable interaction/dialogue between the Secretary/Chief Executive of the IEE and the Director General of the Engineering Council.
(c) It has proved possible to make submissions from the Engineering Council to Government, based on collaborative activity among a number of Institutions; IEE has been able to contribute at least as much as other Institutions.

Relationship has been poor in that:

(a) In a number of instances the Engineering Council has appeared to enter into "competition" with the Institutions for which it was supposed to be the federal body. Examples are:
    (i) prestige lectures arranges by ECROs;
    (ii) establishment of an Industrial Affiliate scheme;
    (iii) involvement in CPD when in fact the activity, of necessity, has to be based in the Institution.
(b) SARTOR-3, while excellent in intention, is a bureaucratic and public relations nightmare. Matching Sections give the Institutions an impossible workload and will ensure that relatively few engineers join the Institutions or register with the Engineering Council in future. In many ways SARTOR-3 represents an "own goal" directed by the Engineering Council and connived in by the Institutions' representatives on the Working Party.
(c) There is an "other worldliness" about some Engineering Council policies and the staff who promote them.
(d) There is a feeling that the Engineering Council sometimes seems to delight in trying to thwart IEE interests. This is particularly the case where Bye-law and Charter changes are concerned.

Institution of Mechanical Engineers

The relationship between the Engineering Council and the Institutions has varied over the years. There were times, particularly in the early days when the Engineering Council seemed to be a body operating separately from the Institutions. In more recent times it has become much more of a partnership at least at the operational level.

John Whitwell, Clive Holtham and myself being asked by Keith Foster to try to identify a better grouping of Institutions. We did but it was not to everyone's liking and was not taken up. Out of this came the concept of DABCE as a single accrediting body.

*Institute of Marine Engineers**

In early 1992 a Council of Presidents of all the Engineering Institutions agreed to set up a steering committee under Sir John Fairclough, the then chairman of the Engineering Council, to chart a way forward for the engineering profession.

The Unification Steering Group consisted of the 1991 Presidents of the ICE, IMechE, IEE, IChemE, IMarE, IIEE, and the Institute of Plumbing, with a Project Director and with Secretarial support seconded from the DTI. The Group reported in 1993 in a report entitled "Engineering into the Millennium". Subsequently joint Engineering Council/Institution working parties were established to modify the recommendations of the Report and to propose an implementation plan. The plan was implemented in 1994. It was subsequently modified, as a result of further discussions between the Institutions and the new Engineering Council, and a new way forward entitled "Building on the Lasting New Relationship" was agreed in 1999.

The vision of the Unification Steering Group was of a strong Engineering Council and a number of Colleges to cover the full span of the profession. The Colleges would be responsible for all Learned Society activities and for most, perhaps all, of the Education and Training needs of the Profession. It was envisaged that the Council would be largely directly elected by the Registrants, would be responsible for standards, registration and codes of conduct, would be the Voice of the Profession and would be the principal point of contact with Government and Industry. The overriding aim was to give Registrants a strong sense of corporate unity (engineers first, marine engineers second) by giving them a sense of ownership of the profession.

I think that it is fair to say that everything that has happened since the 1993 report has had the effect of watering it down to the extent that the situation now is not markedly different from the starting point. If anything the larger Institutions have strengthened their grip on the profession and the Registrants have been further distanced from the notion of a unified profession - if only because of the dismantling of the ECRO and the failure of the Institutions to make the PEIs (what a title) a relevant force in the country.

I am not in a position to respond authoritatively within the suggested framework. My *impression* is that the relationship of the IMarE with the Engineering Council is marginally better than it was, but it must be said that in the Bad Old Days we regarded the Engineering Council as our friend and protector against the cohorts of the Big Three plus the IChemE.

The Welding Institute

In the interests of the engineering profession, the Institutions as a whole need to feel part of a family in which the EncC plays a key role. There needs to be a feeling that we are all pulling the same cart in the same direction, carrying the whole family forward to clearly established objectives. I think that this has not been achieved, and that some (many) feel that the big players still dominate too much with smaller Institutions feeling squeezed out.

Many Institutions feel dominated by Engineering Council and that they have little influence on the decision making processes. This was not helped by the imposition of increasingly time consuming (and thereby costly) procedures (eg SARTOR-3) and the time required to read/digest the avalanche of paper generated by Engineering Council. It became a paper-intensive operation and Institutions were left to extract key matters from the documentation to ensure they were following correct procedures. This situation would have been helped, as we suggested, by a sharply focussed newsletter which stated clearly new decisions and instructed Institutions as to the action required.

Institution of Water Officers

We are impressed with Malcolm Shirley's commitment to the modernisation of the Engineering Council (and we appreciate his Council of Presidents Briefings) and with the work of the Hawley Group. We value the contribution of the Engineering CouncilRep and the help and advice provided by the Engineering Council Secretariat.

Chartered Institution of Water and Environmental Management

The relationship has improved during the past five years and certainly the feeling during the past eighteen months and more recently during this year has been one of a far more positive nature.

Institute of Road Transport Engineers

The Institute's relationship with the Engineering Council has traditionally been very good. IRTE was concerned about raising the entry standards in SARTOR-3 and was pleased that those concerns were taken on board. IRTE is very supportive of the consultation process which gives all Nominated Bodies, irrespective of size, the opportunity to comment and influence.

IRTE has for the past two years been in merger negotiations with The Institution of Plant Engineers and the Engineering Council has been very helpful in an advisory capacity. The implementation of SARTOR-3 has generated much concern but the Engineering Council Staff have always been very helpful and informative.

The Institute of Physics

We feel that the Institute of Physics has a good relationship with the Engineering Council and hope that the Engineering Council has a similar view.

The only significant problem is that of representation on Senate. However, it is recognised that this is difficult for an Institute with a relatively small number of Registrants. Better groupings within Colleges would assist.

The relationship with the Engineering Council has always been good, and has certainly grown and improved over the last five years, particularly with the Institute becoming a Nominated Body in 1996. This has resulted in a more close relationship and more mutual involvement of the staff of both our organisations.

Institution of Chemical Engineers

I fear I decline to respond to the framework but will leave you with a sound bite taken from an IChemE Council member.

"The future of the IChemE does not lie within the Engineering Council. It absorbs our effort without any real return, it has not advanced the status of engineers at all, and is a Tower of Babel with so many irreconcilable and different engineering organisations."

Why do we end up with comments of this kind? I think it is because we persist, in this country, in discussing something called the 'engineering profession' which, I fear, does not exist. The Americans do not fall into the trap. They call the agglomeration of engineering societies the 'engineering professions' because they respect the professions as being individual and different. ..We can form alliances and campaign on issues, but they will be relatively few and far between and do not require signing up to a unity in the profession or whatever phrase is being peddled today. Just because a bunch of subjects have 'engineering' in their title, does not really establish an intellectually respectable case for seeing the disciplines as being cognate or that much related.

We do not have anyone talking up the concept of a science profession. We have 'the sciences'.

I think that this issue has actually caused a lot of trouble for the engineering community. It has caused us to apologise for our diversity rather than celebrating it, but here I am in danger of riding off on a hobby horse.

Association of Cost Engineers

The relationship with the Membership Department of the Engineering Council can only be described as good and it has probably improved over the years. The relationships outside the Membership Department are rather more tenuous. Probably this is because as the Association is small and does not have many permanent staff, the links on the Association side are with the members who actually do the work relating to registration. It is not a case of a manager who is briefed but does not actually do the work.. This was particularly evident at the most recent audit of the Association.

Chartered Institution of Water and Environmental Management

Although the establishment of the Engineering Council in 1981 was a great leap forward we do not believe that it has really fulfilled its proper role. The reasons for this are various but one of the barriers has been its inability to establish a clearly defined relationship with all

member Institutions. This has led to duplication of effort, frustration and a culture of mistrust. We hope that the Hawley Review will resolve this.

Your opinion of the Engineering Council's successes and shortcomings

*Institution of Incorporated Engineers**

Establishing and maintaining a voice (of sorts) with the Government, and developing a common national standard against which we can create international benchmarks for the quality of UK engineering and engineers.

And its partial successes?

The Institutions do spend time talking to each other, and in a number of instances work well together. However, there is still too much fragmentation that undermines the collaborative successes we can achieve. SARTOR-3 has, by and large, been positive for the profession in raising standards and getting industry, academics and the profession rethinking what engineers and technicians are, and what the real needs of UK plc are. Whilst SARTOR-3 provides a strong framework that provides (with a few exceptions) a good match to the needs of the country, there still needs to be more work to make it effective. If we cannot rebalance the Register, it will have failed, and the Institutions (and the Engineering Council) will only have themselves to blame for the continued decline in the status of the profession.

And its shortcomings?

The Register, by and large, remains unsupported by industry, with the number of Registrants on each Section steadily reducing since 1984 (the earliest year for which I have figures).

*Institution of Gas Engineers**

The chief success is the recognition throughout the UK of CEng; IEng; and EngTech; and the registration standards required to attain them. The "Memorandum of Understanding" signed with Government was a step change in the Engineering Council's top level recognition.

Currently less than 6% of the UK's young people are very likely to choose a career in engineering. The Engineering Council shares the responsibility for this critical situation but as part of CPE it is, with Industry, now attempting to turn the tide! Another worrying aspect is the number of young engineers who have the necessary qualifications but who choose not to register with the Engineering Council or in many cases join an Institution. Unless added value can be sold to the young people and their employers the position will be in the short term exasperated and in the long term terminal.

*Institution of Electrical Engineers**

The Engineering Council has had:

(a) Successes

- SARTOR (1 and 2)
- Environment Award
- Memorandum of Understanding with Government
- Young Engineers for Britain

(b) Partial Success
- Neighbourhood Engineers (good in terms of support to schools, a disaster in terms of role models).
- Registration (although continuation of *incorporated engineer* title rather than *chartered technologist* represents, in my view a most unfortunate missed opportunity).

(c) Shortcomings
- Impossible Institution mix; large Institutions and small bodies will always have conflicting needs and aspirations.
- Failed to act as the 'Voice of the Profession' - now some Institutions are voicing doubts as to whether engineering is a single profession!

The Welding Institute

One must not underestimate the problems of forging a single profession out of a collection of Institutions, so this must be seen as a success. Some progress has been made with imaging the profession, but the objective of achieving parity of recognition with medics, architects, lawyers and so forth has not been met. This is not a failure of the Engineering Council itself, but of the engineering industry and profession being unwilling to fund the expensive image building required. The public need to understand that the world as we know it continues and develops through scientists and engineers, and that it is these people, not the media 'personalities' and financial wizards, who are the real contributors to society. However, to change the perception would cost sustained expenditure of a high order and no-one wants to pay.

Institute of Road Transport Engineers

(a) The Engineering Council's Successes to date?
- Generation of a National Register.
- Creation and management of SARTOR.
- Growing recognition as prime informed source on engineering matters.
- Young Engineers for Britain programme.
- The Environment Award for Engineers.
- Annual publication of Digest of Engineering Statistics.

(b) And its partial successes?
- Generation of professional unity and common purpose.
- International qualification correlation.
- PEI Structure.
- NEP.

(c) And its shortcomings?
- Marketing the Register (in the past).
- Failure to promote Engineering Technician section of the Register.
- Unbalanced influence of large Institutions.

Institution of Chemical Engineers

I recently had occasion to write to Malcolm Shirley and included a quote from one of my senior Council members in respect of the Engineering Council. Although harsh, the quote rang true.

"Since it started, it is difficult to find one significant achievement by the Engineering Council, which would not have happened if the Council did not exist."

You would surely come back to me and say, for example, that the original SARTOR was an achievement, but the point is that that could have come about through the inter-Institutional mechanism, without the value add (or lack of it) which comes from the Engineering Council.

Institution of Water Officers

Success in setting standards for the engineering profession (Regulation). Partial success in: recognising the need for and trying to implement change via the Strategy Review and Hawley Group; leading the engineering profession (complete success may be hindered by the influence of some of the large Institutions); and improving communication with Nominated Bodies and with Government. The main shortcoming is in marketing, where efforts are handicapped by the lack of a generic title (equivalent of doctor or pilot) within which the existing categories of CEng, IEng, EngTech would fit.

Institute of Plumbing

The Engineering Council's greatest success has been in the promotion of CEng and through this raising the profile of engineers and of the profession. However, we have worries about the implementation of SARTOR-3, in particular the over-rigid interpretation of 'matching sections' and the reliance on input rather than output standards in degree accreditation.

How do you rate the Engineering Council's relationship with other bodies such as Government, Industry and the Public?

Institute of Physics

The Engineering Council's relations with outside bodies is, on the whole, good. The shortcoming is still in the relationship with the public, although much progress has been made in promoting the profession.

Institute of Marine Engineers

I believe that the relationship of the profession with the Government and Industry (but not the Public) is better than it was and for this the Engineering Council, particularly the current Chairman and the Director General, is entitled to take credit. I think, too, that the administration of the Engineering Council is tighter than it was.

The great failure, and this is reflected in the proposed framework, is that the Engineering Council, in seeking to placate the big Institutions, has failed its membership. There is no mention of the Registrants who do not feel that the Engineering Council is reflecting their views or concerns: and this is odd because it is the Registrants who pay for the Engineering Council through Registration Fees.

Institution of Incorporated Engineers

Adequate. It is undermined by the attempts of some bodies to 'go their own way', independent of the agreed national strategy.

*Institution of Electrical Engineers**

Government	very poor. DTI (Lord Sainsbury) believes Engineering Council is not performing adequately - hence Hawley Group.
EMTA	close linkage, but perhaps not always helpful to professional engineers since EMTA is more involved at technician level.
EEF	far too close, alienating large parts of the profession.
Industry	the Engineering Council is generally regarded as just a stage more useless and ineffective than the Institutions.
Public	unaware of the Engineering Council.

Note also that most Institution members believe (unfairly) that their subscription to the Engineering Council provides them with no benefit. In fact £20/year just to retain the use of CEng designatory letters represents a reasonable bargain.

*Association of Cost Engineers**

With regard to the relationship of the Engineering Council to outside bodies, it has to be admitted that there is not that much evidence, especially with regard to the general public. There is minimal attribution in the broadsheet dailies to pronouncements regarding engineering at all, let alone anything relating to the Engineering Council. When, if ever, has a pronouncement been heard on radio and attributed to the Engineering Council. The Engineering Council is only too aware, no doubt, of the perception of the general public regarding engineering, and in particular the low regard in which it is held in the schools which in the main have a dominance of Arts graduates in the ranks of heads and deputies. Not helped either by the practice within the schools of appointing a careers advisor of someone who is probably under 30 from an Arts discipline, and with no knowledge of the outside world other than their own progression from school through higher education and back to school.

It does appear to the individual engineer that the Engineering Council is of less importance than their own Institution through which they registered, despite the occasional newsletter. This is understandably the case of the members of the major Institutions, and who have their own Charters, and in the ultimate can go their own way. The small Institutions, particularly those who only have a small number of Registrants, may have to fight continually to avoid claims that the Engineering Council is attempting to impose some practices of recruitment and administration. For those who belong to more than one Institution and therefore have a broader view than of a single Institution, it does not come over that the Engineering Council is a dominant body at the forefront of everything. It appears to be more in the background. Especially once an individual has been registered, the most noticeable fact regarding the Engineering Council is the annual renewal fee. Unless an individual engineer has become involved with the Engineering Council, such as acting for the Institution in relation to registration or other activities, there does not seem to be much relevance.

Institution of Water Officers

Present relationship with Government appears to be good. Relationship with employers and the public is poor, with many unaware of the existence or role of the Engineering Council. This should be improved by the current 'Recognising Excellence' campaign.

Institute of Road Transport Engineers

It is difficult to judge relationships at arms length but the need for one effective and authoritative interface, for instance with Government, goes without question. It would appear that Engineering Council is effective in this regard and certainly better than a hotch potch approach from assorted discipline Institutions and Learned Societies on matters of engineering.

The question refers to EMTA but the broader spectrum of training is far reaching encompassing many specific interest and perhaps too big for the Engineering Council to influence. The current level of Engineering Council involvement has to be of benefit in terms of relationship but can it offer the overall leadership and co-ordination role to generate a dynamic impact? The transfer of WISE to EMTA is seen to be a sensible and relationship strengthening move.

The Engineering Council interface with industry will inevitably be tenuous with anticipated questions regarding the need, duplication, effectiveness, cost and necessity of a relationship. The argument for a collective Institutional voice will not always suit differing industrial objectives and priorities. Leadership and benefit are two key elements toward enhancement of Engineering Council industrial standing and there is a long way to go to convince smaller companies where the registration catchment area is arguably greatest.

The engineering profession's relationship with the public at large leaves much to be desired and image enhancement is a massive task in an era when the UK manufacturing base is perceived to be in sharp decline. The Engineering Council has its part to play in the interest regeneration process but cannot be totally accountable for the ultimate result as so many factors are interwoven.

Comments on the organisation of the Engineering Council

*Association of Cost Engineers**

Organisation/administration has improved over the last three years in terms of communication with and involvement of Nominated Bodies. The Strategy Review has provided more focus to Engineering Council activities.

Institution of Electrical Engineers

The Engineering Council has suffered from an unfortunate culture in that it often appears bureaucratic and mechanistic but its responses, rather than being customer-focused - but it still isn't clear who its customers are!

The two most recent Directors General have been unable to provide the leadership required, despite being conscientious, very well intentioned and determined to succeed. To appoint

Directors General with virtually no experience of Institutions or Engineering Council politics, policies or procedures has imposed so steep a required learning curve as to be unscaleable. Neither of the two most recent Directors General has fully mastered the brief.

Chartered Institution of Water and Environmental Management

During six years of contact with the Engineering Council the organisation and administration has greatly improved. The whole complexion has changed from that of a volunteer workforce to a permanent staff who are committed to the aims and objectives of the Engineering Council. This has changed and expanded once again during 2000, lessening the feeling of "us and them".

*Institute of Road Transport Engineers**

The Engineering Council use of modern technology has resulted in a vast improvement in its administration as well as being more environmentally friendly. The Engineering Council website is very informative and reduces the necessity to contact staff. Access to the Engineering Council Register via the Internet will be useful when it becomes available.

The Welding Institute

The organisation/administration provides valuable support to the Nominated Bodies and the staff are willing and co-operative. However, some of the systems and paperwork do not appear to have advanced with modern technology. Staff provide informed advice but the impression sometimes gained is that no definitive answer to a query will be given.

Institute of Physics

The Institute is generally satisfied with the organization and administration of the Engineering Council. The staff are very helpful. Steps to reduce the bureaucracy, e.g., in the lighter touch for audit of Nominated Bodies is appreciated.

Comments on Engineering Council's external communications

Institution of Mechanical Engineers

It was, again in the earlier days particularly successful at gaining publicity (the posters generated good coverage and some controversy) and exposure through collaboration with external bodies (eg through endorsing reports).

Institution of Electrical Engineers

The Engineering Council used to be master of the press release (Ron Kirby) but this activity seems to have fallen by the wayside. Engineering Council publications are visually unattractive. By contrast the Engineering Council website looks good but is difficult to navigate.

Chartered Institution of Water and Environmental Management

External communications have improved possibly to the extent of overload! We still receive volumes of paperwork, some of which is highly relevant, some which wrongly assumes a level of knowledge and some which are neither informative nor noteworthy.

However, we must state at this juncture that the flow of paperwork is now at a manageable level and does on the whole arrive in one envelope instead of three or four posted on the same day.

Association of Cost Engineers

Probably the most important aspect for the Engineering Council in relation to outside communications is for it to bombard the media with continuous campaigns to attempt to distinguish where the Professional Engineer differs from the oily rag brigade, the catastrophes from ignoring the engineering aspects, the tragedy of the lack of recognised engineers in Parliament and other public bodies and anything which keeps the profession in the news. This raises again the question of protected titles and restrictions to licensed engineers. An unfortunate title is the Incorporated Engineer which has overtones of a failed American corporation and is probably about the least recognised qualification in the country. A dynamic, forceful, modern title is desperately needed.

It also appears that the Engineering Council and the registered titles are only known in the 'ex-colonial' world. There would appear to be many countries where it is unknown and Registered Engineers unrecognised. Is this another area where effort is needed, or is there scope for a supra-International Engineering Council.

The Welding Institute

The Engineering Council's external communications are vital in the interests of promoting the engineering profession. The regular Bulletin provides a focussed update on the whole sphere of activities and the regular news releases provide punchy items, useful both to the press and the technical journals.

Institution of Incorporated Engineers

There is a need for a more focussed, high profile communications policy. We need to see the Engineering Council at the front of a lot of positive news about professionalism.

Institute of Road Transport Engineers

Poor, although the recently launched marketing campaign has helped to address this. With the exception of schools literature prior to the marketing campaign I am not aware of any literature aimed at potential Registrants. The vast amount of paper circulated to the Nominated Bodies in the past resulted in most of it not being read!

Legislative communications are representative of the profession.

Suggestions for future priorities

*Institution of Mechanical Engineers**

Somehow we have to get away from the constant criticism, ill-feeling, and sniping at the Engineering Council. Somehow we have to get a situation where the Institutions really do feel some ownership of the Engineering Council. We should not lose sight of the fact that there are 39 Institutions (16 of them Chartered) who look after Chartered and Incorporated Engineers and Engineering Technicians. The Big-4 would claim that their members comprise a large proportion of the Engineering Council Registrants (and this is true). However the Engineering Council is charged with looking after its total Register of approximately 280,000 with just under 200,000 being Chartered Engineers and the rest Incorporated Engineers and Technicians. Moreover one of the larger Institutions is IIE which has a membership of just under 50,000.

How then do we tackle this problem? I have a number of suggestions:-

We should ensure a better dialogue between Engineering Council Senate members and Institution Councils or Executive Committees. In the case of IMechE reporting back from Engineering Council Senate meetings is very ad-hoc and invariably ill prepared.

We should ensure that Presidents and Council Executive Committees are well informed on what is being debated within the Engineering Council.

Accepting that Senators are not "mandated" by Institutions, nevertheless we should try to influence them and explain our Institution view of matters, which are debated.

An example of this is that "Strategy 2005" has been largely debated by the Big-4, but have we in IMechE had any dialogue with John Wood who is on Senate? (or for that matter with Brian Kent who is very influential on Senate).

Association of Cost Engineers

Starting from the present, what would appear to be the most vital activity is to effect a change at the beginning ie in the schools. Therefore, activity to influence the mathematics and science teaching, even in the primary schools is perceived as essential, and the effect of this has to be through the Government as well as the schools and the public. Only if this is improved is there a hope in the long term for there to be sufficient school leavers with the mathematical abilities to be able to embark upon an engineering career. It is unnecessary to stress the public relations continuing effort to eradicate the oily hands message and the impression of low pay. Additionally, there is need to convince all employers that registration is of benefit to them, both in the long and the short term. This can be difficult as exemplified by the problem of getting volunteers to undertake anything when they are in work because of the short term 'unless it is of direct benefit now to xyz Co you can't go'. This is essentially a communication problem which is not helped by the majority who are involved in the 'media' (in the broadest sense) are rarely even of a faintly scientific bent. It is of significance that the course of Higher Education which has the greatest intake is Media Studies. A reflection of Higher Education becoming a mass market with mass standards, abilities and aspirations. A mild campaign to counter the 'I never was good at arithmetic at school' brigade would be welcome, especially if it turned around the scorn of the no-good at arithmetic regarding

things numeric with an even louder those only literate are not really educated unless they are numerate as well. Note how many newspapers will say that something is xyz mW when they really mean MW. Shades of C P Snow's two cultures. Programmes on TV like the 'Forgotten Heroes' can only be a force for good for engineering. Who, seeing the vacuum cleaner driven 'atmospheric railway' could forget it?

Institution of Gas Engineers

The Engineering Council has an important and influential role to perform for the profession in particular and for society in general. There is still disquiet in some quarters on the SARTOR-3 requirements and many young engineers do not see the value of the Engineering Council and Institutions. It is perceived by many that the Engineering Council and the Institutions need to be much more dynamic and that young people will not want to associate with the bureaucracy that still exists. These challenges must be actively and comprehensively addressed with transparent metrics devised and shared.

Institute of Plumbing

You will see we are actively involved in a wide range of issues of importance to both the public and industry. If you were to ask me to identify four key topics, my choice would be:-

- Self-regulation - finding the right balance.
- The urgent need for "joined-up" industry and Government.
- Increased training to EngTech level.
- Greater recognition of competent and committed plumbing professionals.

Institute of Marine Engineers

My contacts with Registrants, which I am bound to say are not numerous, lead me to believe that, after Licensing of Engineers and Technicians, by far the biggest single topic is Unification. This does not necessarily mean that the Fairclough model is the perfect one but, away from Councils and Administrations, individual Engineers look with envy on the Medical, Legal, Accountancy or Architectural professions (to name a few) as well as to the 0Engineering profession in other countries and ask why we cannot emulate them.

Institution of Incorporated Engineers

The new Engineering Council and the Institutions set out with the promise of working to achieve a united profession; one in which the many elements work together in mutual co-operation and collaboration for the common good. Regrettably, despite the efforts of senior members and staff of the Engineering Council and others, including IIE, real progress seems to have been rather less than might have been achieved.

Association of Cost Engineers

If it was possible to start with a completely fresh approach, rather than being saddled with what already exists, there would only be one Chartered body with a series of divisions, together with legally protected titles, and whatever restrictive practices the organisation could get away with.

Chartered Institution of Water and Environmental Management

We feel that CIWEM has at long last been able to grasp what the Engineering Council is looking for from a multidisciplinary Institution. It has been a long and tortuous labour both for members and executive alike, but our hope is that the child will grow and profit from the relationship that has now been established.

Annex I

The Viewpoints of Council, Senate and Staff Members

When this Chronicle was first mooted, a questionnaire inviting opinions and experiences was sent to present and past Council/Senate members and to EngC staff.

There were many responses and a number of interviews subsequently took place. Some of the views expressed have already been quoted in the main text but, in addition, here is a selection of representative opinions under the four headings in the original questionnaire.

1. How and why did you become involved ?
2. What were your aims on joining the EngC – and how far were these realised in practice ?
3. How do you rate the EngC's relationship with other bodies ?
4. Any comments on the 'Fairclough' initiative ?

1. How and why did you become involved?

I became involved in the Council because I was increasingly concerned that the profession saw itself as entirely composed of white, male Chartered Engineers. I wanted to raise the profile of women and Incorporated Engineers, and to promote a more inclusive approach at all levels of the profession. These aims have been realised to some extent, as Incorporated Engineers are recognised as an important resource for industry and the profession, but there remains in my view, a perception that Incorporated Engineers are "failed" Chartered Engineers, a perspective which is in my opinion fundamentally flawed. The same is to some extent true of women; there appears to be a view that attracting women into engineering is no longer important - but whereas women comprise 51% of new lawyers, they only comprise 13% of new engineers.

Barbara Stevens IEng
Council Member

I was actively involved in the various consultations and discussions that took place before and after the Finniston Committee Report in 1980. I felt at the time that we were trying to do too much too quickly. I welcomed, however, the proposal to move towards the licensing of engineers in specific areas of activity. I believe the Engineering Council has had a most difficult task in coming to terms with the main engineering Institutions but is now showing signs of realising a more productive relationship - it takes time!

In 1987/88 I expressed the need for the Engineering Council to promote and encourage the restructuring of the Engineering Institutions to become a less fragmented structure under 5 main groups. At the time, as President of the ICE, I was in discussion with 3 other Institutions regarding possible merger but they did not proceed - an opportunity was lost!

Sir William Francis
Council Member

I knew little, if anything, about the Engineering Council before my appointment, but I believe that was one of the reasons why I was appointed, namely to bring a professional experience from another discipline (Chartered Accountancy) to the discussion and debates.

Sir Michael Lickiss
Council Member

As a Civil Engineer working in Local Government, I had dual membership of both the ICE and the IMunE, with an active involvement at local association level. I was persuaded to stand for election to the Council of IMunE, and became interested and heavily involved in the qualification process. This led to Chairmanship of their Education and Training Committee, which had a close relationship with the corresponding ICE Committee, because of a joint training scheme for 'civil engineers' in local government.

One of the products of this relationship was the creation of the Joint Board of Moderators, a body charged with investigating the accreditation of University degrees and one of the first to be created. I eventually chaired the Board, and became involved in accreditation both in the UK and in a number of overseas countries such as Hong Kong, Singapore, Australia, South Africa and China. I also was a member of the ICE Education & Training Committee, and it became clear to me that the establishment of a framework that could embrace all the recognised Engineering Institutions was both possible and desirable.

David Rogers
BER and International Representation

How was I recruited? Heaven alone knows, but I guess that it was Gordon Beveridge in collusion with Jack Levy. Gordon had been a member of a CEI committee on the four year degree course, which I chaired, so we knew one another well. There was perhaps another reason. I had been Chairman of the Northern Ireland Branch of the CEI, and in 1982 I organised a meeting of the branch at the behest of the embryo Engineering Council, to discuss the handing over of the CEI's Charter. Many of us were not happy at giving-up the Charter to an unknown and unproven body. We were also unhappy at the undemocratic appointment of the Council by the DTI, and the replacement of retiring Members of the Council by an election limited to the Members of Council. One or two Members of Council turned-up at the meeting. I sealed my fate by suggesting that the Council was a self-perpetuating oligarchy. The punishment to fit the crime was my appointment to the Council!

Professor Sir Bernard Crossland
Council Member

I knew very little about the structure of the Council. However I did know that it occupied a pivotal and significant role in relation to the profession.

Claire Curtis-Thomas MP
Senator

2. What were your aims on joining the EngC - and how far were these realised in practice?

To promote the profession and encourage a strong united voice on matters of national policy. To raise professional standards.

To encourage more young people especially women into the engineering profession.
To bring the views of a younger engineer to the deliberations and work of the Council.
The WISE campaign was initiated in 1984. I was able to play a part in the launch and the subsequent campaign. An Engineering Council working party, of which I was a member, prepared an influential booklet on Career Breaks. A film was also made.
The relationship between the Engineering Council and the Institution of Civil Engineers was particularly poor in the early years but has now markedly improved.
I believe some early influential statements were made on the role of engineers and their standing in society. Qualification Standards were also improved.

Joanna Kennedy
Council Member

I was perhaps an idealist, who had been deeply involved in engineering education and training, and closely involved in industrial research.

(a) I wanted to see a much closer relationship between industry and education, as is commonly the case in Germany.
(b) I wanted to see a condensation of the far too many engineering Institutions, and a very much closer relationship between the few remaining Institutions. Ideally I wanted a single engineering Institution, with very strong divisions such as in the VDI in Germany and the IEI in Ireland.
(c) The Finniston Report placed on us the duty to promote the development of our manufacturing base, which has been shrinking since the end of the Second World War, and I saw this as vitally important.
(d) I wanted a four year degree course, which if I had had my way would have been known as the DiplIng, which would have clearly distinguished it from the public understanding of the term engineer.

Except for this last item my aims were not realised in practice and no progress was made towards achieving them. Despite the Engineering Council introducing Industrial Membership to obtain additional financial support, there was no development of a closer relationship between industry and academia. There has been little reduction of the far too many engineering Institutions, and now that they have the upper hand there is no likelihood of progress on this front. During the life of the Engineering Council the steady decline of our manufacturing base has accelerated, until it now represents 13% (?) of our national GNP. What is worse the Engineering Council appears to accept this decline as inevitable; I don't.

Professor Sir Bernard Cr ossland

To widen the concept and deepen the perception of the engineering base. Supporting the inclusion of engineers and technicians from all walks of academic and practical life, plus driving greater improvements in links between industry and professional engineering Institutions. To discover and achieve a better understanding of the engineering profession and its membership in order to promote it to the community, industry and politicians wherever possible. To learn and improve personal skills.

Upon reflection my aims were too far ahead to witness more than a limited success whilst an Elected Member of Council. To gain an understanding amongst my fellow EngC Members in the early days, took a lot of patience and a good deal of ingenuity to bring about small but

continuous change and understanding of the issues involved, albeit their kindness and thoughtfulness during my recovery from a heart attack was tremendous.

John Waters IEng
Council Member

Initially outstanding progress was made with co-operation with many associated institutions. I was involved with the following:

CET publications:	A Call to Action
	CET - A National System for Engineering (a consultative document)
	CET National Pilot Scheme.
	Management & Business Skills for Engineers.
Engineers & Risk issues:	Code of Practice.
	Guidelines on Risk Issues.
Engineers & The Environment:	Code of Professional Practice
	Guidelines on Environmental Issues
Career Break video:	The Other Half

The publications and issues listed above all met with significant success.

Career Break progress was limited as the Government, at that time, gave less focus than the current Government to these issues. At that time the Engineering Council was regarded as one of the leading organisations on Career Break Issues. Much of the research data is still relevant.

Bernard Dawkins
Sometime CET/CPD Executive

At the beginning of my appointment, I realised that the first hour of each day was spent in replying to letters of complaint from various institutions, mostly in connection with registration. Most of them had some justification. It was clear that the relations with the Institutions in this area could be improved, so I also set a target to try to achieve an improvement. This proved to be timely because of the 'unification' initiative of Sir John Fairclough.

As far as the structure of the Engineering Council is concerned, I achieved my main objective of improving a particular aspect of the relationship between the EngC and the Institutions. This was the move to introduce Quality Assurance of the procedures within each Institution for assessment for registration, coupled with more comprehensive guidance from the Council for each section of the register. This was not without pain, but the complaints subsequently fell dramatically. The whole structure was changed with the creation of the new Council, but the new structure incorporates the quality assurance system that was introduced.

Professor Keith Foster
Director Engineering Profession 1990-95

I joined specifically to help produce and launch the Code on Risk and was determined that despite the doubts and in some cases quite severe opposition from the professional Institutions that this overarching statement of good practice should be promulgated under the auspices of the Engineering Council. When this had been achieved and using what I had

learned of the strained and difficult relationship with the Institutions during the launch of the Risk Code I was delighted to be able to work with John Fairclough to bring about the arrangements that led to the Unification of the Profession and the closer relationships with the Institutions that now exist.

My personal aims were fully realised in that the Risk code was produced and launched and has stood the test of time as a statement of good practice. The only significant difficulties with this work came from certain Institutions who considered that the Engineering Council should not be doing it and they were unhelpful in progressing it. Their objections and concerns were largely overcome by argument and persuasion, the most powerful being that if it were so important to be done by the Institutions why had they not co-operated to produce it to date since it was clearly helpful guidance needed by individual engineers and companies.

Kenneth Burrage
Senator

a) To raise the standing of professional engineering in the UK through firm but fair application of the regulations for the Register.
b) To build a more productive relationship with the major Institutions.
c) To acquire research, networks and statistics which would ensure that the Engineering Council was seen as a respected source of information on the supply and demand for engineering in the UK.

I now have a better appreciation (though not understanding) of the destructive effect of poorly-briefed Presidents and Secretaries-General on integration within the profession. Despite everything, I have been able to maintain regular meetings with key Secretaries and Deputy Secretaries of the nine biggest Institutions, and believe I have successfully averted some of the potentially damaging conflicts on regulation matters. Nevertheless, much more needs to be done.

Great progress has been made with the Digest of Statistics, covering related educational provision from school to university, and some of the proxies for demand. Initial progress has been made in establishing the basis for research in connection with the National Curriculum.

Andrew Ramsay
Director Engineers Regulation

3. How do you rate the EngC's relationships with other bodies?

The Engineering Council has had notable successes. It has established itself as the body that represents all engineers and their Institutions via the registration process for Chartered and Incorporated Engineers. The Council has become influential in Government affairs relating to education, training, employment and economic development. The Engineering Council has also made some inroads in promoting the status of engineers and engineering although it is debatable whether more could have been done if the focus was appropriate.

The focus has been on the formality of recognition and status rather than the enhancement of skills and individual development. There is, I believe, thus a need to further promote the engineering profession to encourage a better quality and quantity of graduates motivated to want an engineering career. I welcome the work of the 'Campaign to Promote Engineering'

(CPE) and look to even stronger co-operation between the Engineering Council and CPE in future. With renewed Government interest in science and technology from Lord Sainsbury, Steven Byers and David Blunkett the time is right to make bold proposals on how to restructure the engineering profession - hence the value and timeliness of the Robert Hawley work.

I am not really in a position to rate the Engineering Council's relationships with outside bodies, but my perception is that there are too many competing organisations with vested interests and confused objectives. This undoubtedly dilutes their best intentions and sadly often ends in unproductive "turf wars" which, if anything, dilutes and distracts the Engineering Council's own objectives.

Michael Kipp
Senator

My summary of the Engineering Council's current relationship with stakeholders is:

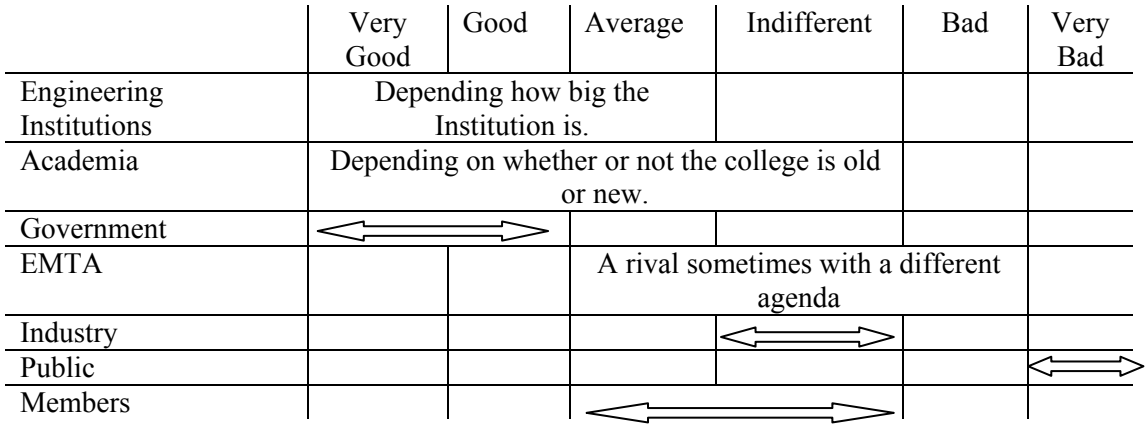
Engineering Institutions	-	vastly improved, but still tense at times.
Academia	-	has always been, and continues to be, strong.
Government	-	the profession is seen to be less relevant that the trade unions, or academia, or management. Could do better!
Industry	-	with few exceptions, registration, and hence the Engineering Council, is seen as irrelevant.
The Public	-	is almost totally unaware of the Engineering Council's existence.

Barbara Stephens IEng

I wanted to defer my reply until I had met with a group of 20 experienced engineers (my fellow engineering graduates of 1947) from various disciplines to hear how the Engineering Council had impacted on their careers and professional activities.

Perhaps partly because their comments - even allowing for the inevitable hand-wringing by any group of septuagenarians - were generally rather dismissive of the Engineering Council, registration, *et al*, my reflections may appear unduly critical. But this is mainly due to my own feeling, although a firm supporter of the Engineering Council concept, that it has rather lost its way in recent years.

Professor John Caldwell



Claire Curtis Thomas MP

4. Any comment on the Fairclough Initiative?

The recent changes appear to give a better balance. We must involve the Institutions but not let them gain free access to the running of the Council. If we go too far in this direction, we will follow the sorry path of the PEIs. Senate is necessary but it is rather ponderous. Meetings should perhaps be extended into the afternoon to allow more open debate on issues of the time. Consider inviting Chief Executives and Presidents of major Institutions (one Institution at a time) to Senate and invite them to present their approach to running, and making more effective, the Partnership.

Les Mercer
Senator

So far as the Unification project is concerned my personal aims were achieved in that I wished to help create the framework where the whole engineering profession could speak with one voice and act together. I believe we achieved an appropriate framework although the extent to which it has been used to drive the profession forward to become more visible, more vigorous and more unified is perhaps debatable and somewhat of a disappointment to me. The main difficulty in this work was of course the suspicion and vested interests of the Institutions, in particular the "big 4". The crucial turning point came with the winning over of the IEE President Alan Rudge to the cause and his success in hammering out the compromise that the other big Institutions would accept. In my opinion most if not all the fears expressed at the time by the Institutions concerning loss of their power, status, identity or control although understandable were unfounded. I suspect that most of the ill feeling that existed at that time was more to do with way in which the Engineering Council had originally come into being and the personalities of the individuals involved than it was based on any rational thinking.

Kenneth Burrage

I hope it will be possible to describe the processes which led to reform of the Engineering Council in 1996. The model developed achieved wide consensus support, and incorporated ideas from the Construction Industry Council as well as balancing political desires to 'unify' the profession with the understandable independence held dear by long-established engineering Institutions. Unfortunately, the crucial new development - the Board for the Engineering Profession, which should have been a force for integration and sharing of ideals and opportunities within the profession - was not properly understood by its first members, or indeed by the newly-appointed Director-General and the Director for the Engineering Profession. It needs much greater buy-in from Institutions in order to succeed in capturing jointly-agreed projects and identifying common public relations issued.

Andrew Ramsay

The present size of the Engineering Council Senate seems to be very unwieldy and perhaps accounts in part for the lack of demonstrable progress, or of notable initiatives, since the 1995 reformation of the Engineering Council. Thus, in the current leaflet outlining the work of the council, only *one* of the nine "Key Initiatives" listed therein was not already firmly in place some years before 1995. And that one initiative - the "Regional Network" - can scarcely be called successful. The work of the Board for the Engineering Profession seems to have been especially unproductive of new ideas; - perhaps reflecting the on-going tension between the

(large) engineering Institutions and the Engineering Council. It is not clear that the reformed Engineering Council is any more effective than the old - rather to the contrary.

Professor John Caldwell

With hindsight I have one over-riding view which affects almost everything within the environment called the Engineering Council and whilst Sir William Barlow said this many, many years ago, I find it worryingly still true and very much responsible for many frustrations which have inhibited the direction and influence of the Engineering Council.

When I look at the four senior Presidents who finalised the negotiations with Sir John Fairclough for the shape of the new Engineering Council it is clear that subsequently when they were no longer Presidents of their Institutions the messages and actions from "their" Institutions were very different than at the time of negotiation and agreement.

It seems to me that the President of an Institution these days does not necessarily speak at all for the deep held views of his Institution and many of his speeches are personal and are certainly not supported by a large majority of his membership and this has been particularly true in the last 2 or 3 years within the Institution of Civil Engineers.

We therefore have a very odd situation where agreements to proceed within the general "environment of engineering" are made by specific individuals who held their post as President for one year and then are by no means followed up and supported by their particular Institutions shaping the detail where, as Sir John Fairclough said, "the devil lies".

Furthermore, the top-down Government responsibility via the DTI is also similarly dependent upon particularly transient Ministers and Civil Servants and therefore when an agreement is made between everybody concerned, it is strange that the people who made it do not necessarily have to carry it out in the spirit in which it was conceived.

Brian Kent
Senator

I was well aware of the background of the Council and the process that had been taking place (The Fairclough Initiative) begun by Sir John Fairclough. I was unaware of the deep remaining disagreements between engineering institutions concerning Unification and the future role of the Council. I was also unaware of their suspicions that a hidden agenda remained to amalgamate them. Sir John Fairclough later acknowledged to me his concern that, had I known, I might have hesitated before accepting the job.

It also transpired that completion of arrangements on the way ahead was not nearly as far forward as I had been led to believe. As examples, the new Royal Charter was still far from agreed and we were extremely hard pressed to complete the work in time for the launch of Unification and the New Council at the beginning of 1996. Also, no thought had been given to organising an event to mark the launch and it proved very difficult to book a major London venue in the time available. None of the major Institutions was prepared to help, judging the notice to be too short and the funding inadequate. I could not help noticing an element of unholy glee at our predicament!

It was clear that they saw nothing to celebrate in Unification, one of them still refusing to accept the word even after the thousands of hours of discussion to arrive at the famous

Declaration of Intent. In the end, we were able to find one remaining window of opportunity at the QE II Conference Centre and a successful event was held with speakers that included Sir Michael Heseltine and Sir Alastair Morton.

Mike Heath
Director General 1995-98

Council member John Lyons contributes this to the political history:

Of course, others had been pressing for an inquiry. But the TUC resolution [see Chapter 1] was the catalyst, the event that tipped the argument in Callaghan's mind when it mattered. At that time he had good cause to want to find something that he could do for the TUC, given all the difficulties between the unions and the Government there were in that period. That was my motivation in submitting our motion to the TUC in 1976). It is why Bernard Donoughue got involved. Donoughue was Wilson/Callaghan's political adviser. We were in contact on and off about the industrial relations scene as it affected the electricity supply industry, and also became friends as a consequence. Following a meeting I had with Sir Peter Carey, then the Permanent Secretary of the DTI, when he told me he saw no point in the inquiry the TUC and others were pressing for, I talked the issue over with Donoughue, ending by asking him if he would be prepared to brief Callaghan on it and get him on side. As he records in his book (*Prime Minister – The Conduct of Policy under Harold Wilson and James Callaghan – Bernard Donoughue, Jonathan Cape 1987)*, he agreed to do so.

That intervention was decisive. I drafted terms of reference for consideration that I gave to Donoughue, and they were as close to those finally adopted (about which I was also formally consulted by Callaghan) as made no material difference.

What was absolutely essential was that the Institutions should be kept at bay. I thought at the time, and have not changed my view, that creating a Chartered EC was a fatal mistake, though I did hope -I really did - that the work of the EC would demonstrate that I was wrong. Creating it as a Chartered body encouraged the Institutions, quite naturally, to think that the EC's *modus operandi* was essentially complimentary to theirs and, therefore, that it was an organisation which one day they should and would be able to bring under their wing once the founders of the EC and their immediate successors had done their stuff.

It is a very great pity that the Engineering Council was set up just too late. If it had been done in Callaghan's time I think it is reasonably likely it would have been created as a statutory body. Bernard (now Lord) Donoughue, doesn't think so, but a statutory body would have been much more in tune with the mind-set of the Callaghan Government and, of course, trade union influence would have still carried weight, whereas by the time Keith Joseph was in charge, we were completely out of the loop. However, whether, in the face of Institutional and departmental pressures, a Tory Government would have continued to finance a statutory bodyafter say the first five years is another unknown.

List of Names of Persons

To locate references to a person or subject in the text of the Chronicle, click on **Edit**, click on **Find**, type the name or subject required in the **Find What** box, then click on **Find** and **Find Again** to locate further references.
Note: Individuals only commemorated in Westminster Abbey are NOT listed here.

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Hutchinson, Malcolm
Illston, John
Jackson, Robert
James, Adam
Johnstone, Susan
Jones, Robert
Joseph, Sir Keith
Judd, David
Kennedy, Joanna
Kennedy, Malcolm
Kent, Brian
Kent, Duke of
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List of Subjects

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About the Authors

Colin R Chapman

Colin Chapman spent 35 years in the Electricity Supply Industry. He worked in fossil-fired and nuclear power plants initially as a Chemist and then in Engineering in the UK and overseas. He ultimately became responsible for training policy for Nuclear Electric plc.

He founded the South West Branch of the Institution of Nuclear Engineers and for several years was Chairman of the Institute of Energy's Membership Committee. He joined the Engineering Council staff in 1997 on a part-time basis where he continues to manage a team of some 70 volunteer engineers.

He spends the remainder of his time advising the United Nations, lecturing for the Chemical Industries Association, and acting as a tutor for the Open University. He is a Fellow of the Society of Genealogists and has written 14 books on British Social History; on which he also lectures world-wide.

He is a Chartered Chemist and a Chartered Engineer, a Fellow of the Royal Society of Chemistry, the Royal Society for the Promotion of Health, the Energy Institute and the Institution of Nuclear Engineers.

He is a member of the Courts of the University of Bristol and of University College Northampton, and is an Honorary Fellow of the latter.

Professor J.C. (Jack) Levy

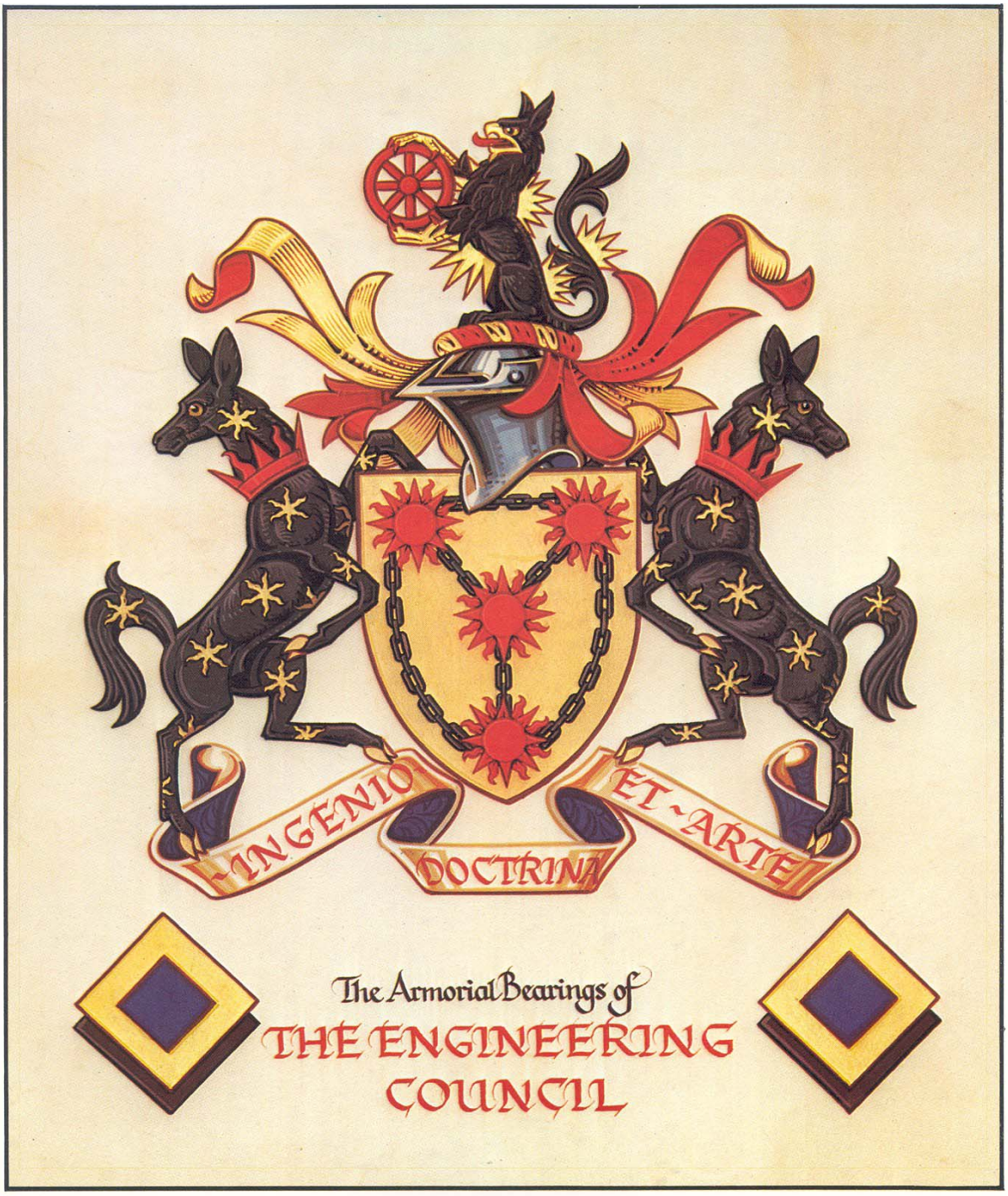
Jack Levy received his engineering education at Imperial College and in the USA. He spent several years in the aircraft design industry before joining the City University, London where he became Professor and Head of Mechanical and Manufacturing Engineering. From 1978 to 82 he was Pro Vice-chancellor. Also, from 1963 to 1983 he was a consultant to Shell International Marine on ship structures.

In 1983 he joined the recently formed Engineering Council as Director - Engineering Profession, carrying executive responsibility for the development of national Education and Training standards for professional engineers. Also for international contacts of the profession. He returned in 1997 to lead the preparation of a new edition of SARTOR.

He now runs Levytator Ltd formed to exploit advances in escalator technology.

He is a Fellow of the Royal Academy of Engineering, the Institution of Mechanical Engineers, the Royal Aeronautical Society and the Irish Academy of Engineering.

In 1984 he was awarded the OBE and in 1999 a Gold medal from the World Federation of Engineering Organisations (WFEO). He holds Honorary Doctorates from four UK Universities.



The Armorial Achievement of the Engineering Council

(The Latin motto "Ingenio Doctrina et Arte" translates as
"with Ability, Knowledge and Skill")

The arms on the shield depict suns, representing energy duly chained, and thus controlled for the benefit of humankind. The crest is a male gryphon, anciently a creature associated with the sun. The male version is peculiar to English heraldry and emits sparks of fire or energy from its body. The gryphon holds a wheel as an allusion to the antiquity of engineering. The heraldic beasts shown as supporters, two pantheons with rayonny coronets about their necks, were held from the 15th Century to live among the stars as creatures of the universe, and thus they symbolize the universality of engineering and its dependence on energy.