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SELECT COMMITTEE ON
THE EUROPEAN COMMUNITIES

A COMMUNITY FRAMEWORK
FOR R & D

WITH EVIDENCE

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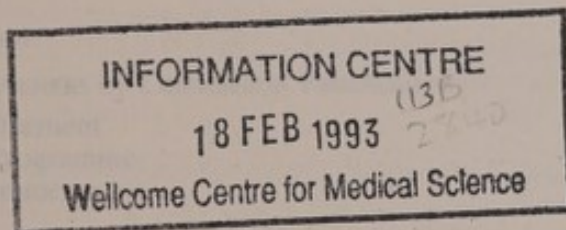
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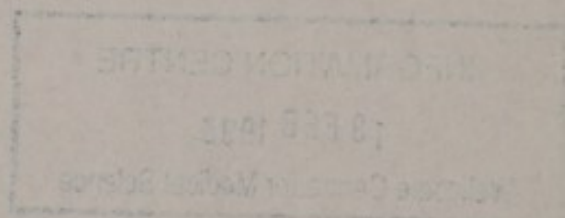
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(Q) refers to a question in oral evidence;

(p) refers to a page of written evidence.

SEVENTEENTH REPORT

26 JUNE 1990

By the Select Committee appointed to consider Community proposals, whether in draft or otherwise, to obtain all necessary information about them, and to make reports on those which, in the opinion of the Committee, raise important questions of policy or principle, and on other questions to which the Committee consider that the special attention of the House should be drawn.

ORDERED TO REPORT:

A COMMUNITY FRAMEWORK FOR R & D

8375/89
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COM(89)397

Draft Decision concerning the framework programme of Community activities in the field of research and technological development (1990-94).

PART 1 COMMUNITY INVOLVEMENT IN R & D

INTRODUCTION

1. Research and development (R & D) are a key to industrial competitiveness. A company involving itself in this may develop a keen competitive edge, but can also face heavy costs, which will grow as technical complexity increases. The higher education sector also has a major part to play. There are national benefits for a country fostering R & D collaboration: indeed research on projects too expensive or complex for individual companies can achieve results otherwise impossible. The European Community too can benefit from collaborative research across the borders of Member States, and beyond.

2. Since its foundation, the Community has been involved in R & D. But early work was limited to coal, steel and nuclear power where there was competence under the Treaties setting up the European Coal and Steel and Atomic Energy Communities. It was not until the early 1980s that the Commission turned towards the idea of a Community framework programme. On 25 July 1983, the Council of Research Ministers agreed a first, four-year Framework Programme (1984-87)¹ for the medium-term planning of R & D at Community level. But action by the Community was still constrained by the absence of a clear legal competence for a general involvement in R & D.

IMPACT OF THE SEA

3. The Single European Act (SEA) of 1987 changed this radically. A new Title (Research and Technological Development) was added to the EEC Treaty². The Community was given a new aim: "to strengthen the scientific and technological basis of European industry and to encourage it to become more competitive at international level". The Community was to implement research, technological development and demonstration programmes by promoting co-operation with undertakings, research centres and universities; to disseminate results; and to stimulate the training and mobility of researchers. Thus for the first time, research and technology development policy was given equal status with other areas of express Community competence.

THE SECOND FRAMEWORK PROGRAMME

4. In 1987 the Community also agreed a Second Framework Programme for R & D³, covering 1987-91 (five years, not four as previously) and worth 6.48 becu (then equivalent to £4.46 billion).

¹ OJ C 208, 4.8.83, p 1.

² Articles 130(f)-(q) of the EEC Treaty, introduced by the SEA.

³ OJ L 302, 24.10.87, p 1. The Commission's original proposal was submitted in 1986, but arguments over the financial commitment delayed agreement.

The main emphasis of the programme was to improve Europe's industrial competitiveness. Most of the money was for research linked with industrial development, but some was for science and engineering projects not immediately related to industrial interests.

THE THIRD FRAMEWORK PROGRAMME

5. In 1989 the Commission proposed a Third Framework Programme 1990-94¹, which would overlap with the existing one by two years. This followed the Commission's own Report on the State of Science and Technology in the Community² and the Report of the "Five Wise Men" into the Second Framework Programme³. The Commission argued⁴ for a new programme rather than for a revision of the existing one because of the accelerating pace of technological progress; the need to strengthen Europe's industrial competitiveness; and "... the need to respond in a more effective way to the directions fixed by the Single [European] Act ...". The main change was the ordering of activities around six strategic "lines", grouped under three headings. The balance of funding between areas would change (more details are given in Appendix 4) and there were elements both of "necessary continuity" and of "discontinuity and novelty" with existing programmes. The Commission also undertook both to develop a "global initiative" for improving the dissemination of research results, and to improve the efficiency of its management.

6. The Commission's proposal was given high priority by the Council and, after detailed negotiation, was unanimously agreed on 15 December 1989, subject to a final "conciliation" procedure with the European Parliament. This was completed in February 1990. The total level of funding agreed was 5.7 becu (£4.2 billion), comprising 2.5 becu (£1.8 billion) for 1990-92 and 3.2 becu (£2.3 billion) for 1993-94. The six strategic "lines" were:

- (i) Information and communications technologies;
- (ii) Industrial and materials technologies;
- (iii) Environment;
- (iv) Life sciences and technologies;
- (v) Energy;
- (vi) Human capital and mobility⁵.

THE PURPOSE OF THIS REPORT

7. The Commission's proposal for The Third Framework Programme was referred to Sub-Committee B (Energy, Transport and Technology). In November 1989, the Sub-Committee took oral evidence from the Hon. Douglas Hogg, M.P., Minister for Industry in the Department of Trade and Industry, and from Professor Paolo Fasella, Director-General, Directorate-General XII, European Commission. They also took a limited amount of written evidence. From that evidence, the Sub-Committee concluded that the document then before the Council was in general satisfactory, subject to final agreement of a number of details in the technical annex. They were thus glad to note the Council's subsequent agreement of the proposal.

8. This Report accordingly concentrates on a number of general issues arising from the evidence, the significance of which can be expected to increase as successive framework programmes grow in importance. The most important is the question of additionality of money received in the United Kingdom from Community funds and the apparent attribution of such funds to Departmental budgets. How this system works is set out in paragraphs 23-27 below and the evidence taken from the Treasury and from a number of other witnesses is summarised in paragraphs 54-64 below. The Committee's Opinion on additionality is to be found in paragraphs 91-102 below, summarised in paragraphs 118-121 below.

9. Part 2 of this Report attempts to explain how the Community's involvement in R & D actually works and Parts 3-5 summarise the evidence received. Part 6 sets out the Committee's opinions, which are summarised in Part 7. A list of members of the Sub-Committee appears in Appendix 1. The Sub-Committee are most grateful to those members of the Select Committee

¹ OJ C 243, 23.9.89.

² COM(88)647 Final, 10086/88 (December 1988).

³ SEC(89)1139, "Report of the Framework Programme Review Board", June 1989, by Pierre Aigrain, Sir Geoffrey Allen, Eduardo de Arontes e Olivera, Umberto Columbo and Hubert Markl.

⁴ In its Foreword to the Proposal, paragraphs 4-5.

⁵ HC Deb, 17 January 1990 col 318.

on Science and Technology who assisted them during the enquiry. A list of witnesses appears in Appendix 2.

PART 2 HOW THE SYSTEM WORKS

THE FRAMEWORK AND THE SPECIFIC PROGRAMMES

10. As the title implies, a framework programme sets broad policy objectives, lays down overall financial commitments and indicates in general terms the areas where the Community will fund R & D. The Commission, after consultation with the scientific and business communities, presents a proposal for a multiannual programme to the Community's Council of Research Ministers ("the Council"). The proposal has to be approved unanimously by the Council after the European Parliament and the Economic and Social Committee have been consulted.

11. Once a framework programme has been adopted, the Commission proposes a number of programmes within the areas specified in the framework. These are usually identified by acronyms, such as MAST (for Marine Science and Technology) or DRIVE (for information on road safety). Under the co-operation procedure introduced by the Single European Act (applicable to the adoption of specific programmes), the Council can act by qualified majority to adopt specific programmes and need not be unanimous. The Economic and Social Committee must be consulted, but the European Parliament plays a larger part, as an amendment supported by both the Parliament and the Commission can only be rejected if the Council is unanimous. Detailed arrangements for financing each programme (including the Community Budget contribution) must be fixed when the programme is adopted.

EXPERT INPUT

12. The Commission receives specialist advice when drawing up both the framework programme and the specific programmes. In particular, three committees aim to ensure that industry, the scientific community and public authorities all have an influence. The first is the Scientific and Technical Research Committee (CREST), on which two representatives of each national government serve. CREST coordinates research policies between Member States and the Community. It is chaired by a senior Commission official.

13. The second Committee is called CODEST (Committee for the European Development of Science and Technology). This prepares strategies and proposals for new areas for support, especially in basic research and in fields important to universities and scientific organisations. Its members are figures well-known in science, technology and industry.

14. The third Committee is IRDAC (Industrial Research and Development Advisory Committee), which advises on industrial research and development. Fourteen members with experience in these areas are appointed on an individual basis by the Commission and four others represent UNICE (the Community equivalent of the CBI), the European TUC (ETUC), the European Centre of Public Enterprises (EEP) and the European Association of Industrial Research Institutes (FEICRO).

15. The Commission also takes advice from a Specialist Committee on nuclear matters; and from special support committees for specific programmes, on which two representatives of each Member State serve.

PARTICIPATION IN SPECIFIC PROGRAMMES

16. It is open to industrial companies, universities and private and public research institutes to bid for participation in specific programmes. But partners from at least two Member States must be involved. The Commission attaches great importance to participation by small and medium-sized enterprises (SMEs)¹ and has set up "Euro-Info-Centres" in all Member States to provide information on the support of research and technology. Most specific programmes are also open to partners from the EFTA countries (on the basis of separate agreements between the Community and individual EFTA States) provided that at least two partners from different Member States are also involved.

SELECTION OF PROJECTS FOR COMMUNITY SUPPORT

17. Once a specific programme has been proposed by the Commission (but often before it has been adopted by the Council), the Commission will issue a "Call for Proposals", inviting applications for projects to receive support. This is published in the Official Journal and states

¹ Defined in paragraph 42 below.

when applications must be made (usually within between six weeks and four months) and describes the programme, the application procedures, the extent of financial contribution available and the selection criteria.

18. The Commission's "Guide for Applicants"¹ gives the following selection criteria:

- (i) Compliance with the aims of the programme;
- (ii) Cross-border character;
- (iii) Scientific and technical quality and originality;
- (iv) Innovative potential;
- (v) Industrial relevance and influence on competitiveness;
- (vi) Feasibility of implementation;
- (vii) Scientific qualifications of the applicant;
- (viii) Pre-competitive character²;
- (ix) Amount of EC funding;
- (x) Composition of the partnership.

19. There are also specific criteria for the individual programmes which vary according to their stated objectives. The Commission produces a standard proposal form for all projects and can help interested parties find partners from other States.

20. Once projects are submitted, a short list is drawn up by the Commission, with the help of independent referees, scientists from across the Community, who evaluate the scientific and technical aspects of a project without knowing the identity or nationality of the applicant. The list of selected projects is then appraised by the appropriate programme committee before the relevant Directorate-General (usually Directorate-General XII) of the Commission takes the final decision.

TYPES OF COMMUNITY SUPPORT

21. According to the Commission's "Guide for Applicants", there are three kinds of Community support for R & D³. The first is "contracted research" with cost sharing, which accounts for 80 per cent of funds available under the framework programme, including funding for all the large-scale programmes. The participants raise much of the finance themselves (usually half) and the Community reimburses up to 50 per cent of the project costs of participant companies or institutes which operate project costing systems. Universities, Higher Education Institutions and other non-commercial bodies whose primary activities are not related to research and which do not have an adequate costing system for determining the full research costs of a project, receive up to 100 per cent of the extra costs, including project costs that cannot be covered from the participant's own budget, grants or resources from third parties, such as costs for temporary staff engaged specifically for the project.

22. The second type of support is "concertation". The Community only reimburses co-ordination costs, such as those of arranging meetings and travelling expenses, and not actual research costs. Thirdly, the Community has its own research projects, carried out by the Joint Research Centre (JRC) at Ispra in Italy, Geel in Belgium, Petten in the Netherlands and Karlsruhe in West Germany.

THE FATE OF COMMUNITY FUNDS: ADDITIONALITY AND ATTRIBUTION

23. Community funds are made available directly to applicants whose projects are selected. But, as far as the United Kingdom is concerned, the evidence to this Committee revealed disquiet concerning Treasury action to "take account of" such funds in setting public expenditure levels to make the best use of available resources. The Treasury's explanation of the system is summarised in paragraphs 54–58 and 63–4 (and printed in full on pp 54ff of the evidence to this report), and witnesses' concerns are summarised in paragraphs 59–62.

¹ EC Research Funding—A guide for Applicants, published by Directorate-General XII, European Commission (January 1990).

² The Commission's definition of pre-competitive research is considered in paragraph 36 below.

³ This Guide distinguishes Community R & D projects from non-Community co-operation in Europe, such as is available under the COST Programme set up in 1971, in which all OECD countries participate. Under COST, planning is done jointly, but the Commission only funds the services of the Secretariat, with occasional financing for studies.

24. In trying to ascertain what happens, the Committee came upon the two related principles: "additionality" and "attribution". The principle of additionality as it relates to the Structural Funds is enshrined in Community law¹:

"In establishing and implementing the Community support frameworks, the Commission and the Member States shall ensure that the increase in the appropriations for the funds provided for in Article 12(2) of Regulation (EEC) No. 2052/88 has a genuine additional economic impact in the regions concerned and results in at least an equivalent increase in the total volume of official or similar (Community and national) structural aid in the Member State concerned, taking into account the macro-economic circumstances in which the funding takes place."

25. This provision is intended to ensure that receipts from Community funds (in this case, under the Structural Funds) are in addition to public expenditure, not in lieu of it. Nor should the allocation of Community funds lead to a cut in public expenditure. The Court of Auditors keeps a watchful eye on additionality and, in its Report for 1988² (Section 10) considered the particular case of funding for transport infrastructure, concluding (Section 10.12):

"In the FR of Germany, Ireland and the United Kingdom, however, the Court's enquiries showed that there was no demonstrable link between the receipt of Community funds and higher spending on transport infrastructure projects."

26. The principle of "attribution" on the other hand is not enshrined in Community law and its interpretation is therefore more subjective. It appears from the evidence (summarised in paragraphs 54-64) that the Treasury attributes funds received under Community R & D programmes to individual Departmental Budgets and, in the following annual public expenditure round, adjusts those budgets to take account of these Community funds. Each Department has to decide for itself what to do to make the adjustments required by the Treasury in order to take account of Community funds. Thus it can happen that a body which receives Community support may find, if it also receives support from a central Government Department, that in the year following the receipt of Community funds the support it receives from a central Government Department is reduced. This in turn can have an effect as far as "additionality" is concerned: such a reduction can mean that the Community funds received are not fully additional to those national Government funds available to individual applicants—and may not be additional at all.

27. Once again, the Court of Auditors provides an interesting parallel in the case of transport infrastructure³ and in particular for Department of Transport road projects:

"The Community contribution is in practice appropriated in aid of the general Department of Transport vote. In consequence it does not stimulate any increase in the roads programme, but acts only as a subvention to the general funds of the Department ...".

¹ Article 9 of Regulation 4253/88 (19 December 1988), a Regulation which co-ordinates the activities of the Structural Funds.

² OJ C 312, 12.12.89.

³ Ibid, section 10.13(a).

PART 3 EVIDENCE: SCOPE OF THE PROGRAMME

THE IMPORTANCE OF A COMMUNITY FRAMEWORK PROGRAMME

28. Witnesses generally agreed that a Community framework for R & D was needed and that a broad framework programme, which left details for agreement later on, was the best way to achieve a political consensus both on policy and on objectives. For British Aerospace, the programme was "highly desirable, if not essential" as a contribution to industrial competitiveness. If a high technology industry was to keep its competitive edge, it must do more than just "buy-in" research, both because competitors would not be keen to sell and because it was often not possible properly to acquire a technology "without a 'hands on' involvement in its development" (p 73, 75). Dr. Webb of Oxford University confirmed that there was "no substitute for doing your own research" and a continuity of hands-on experience was important (p 116).

29. The Hon. Douglas Hogg, M.P. (Mr. Hogg), Minister for Industry in the Department of Trade and Industry (DTI), identified a need to establish the resources and manufacturing capacity which could "meet the challenge of the Japanese" (Q 44). But the Confederation of British Industry (CBI) pointed to the need to assess future global markets rather than just emulate the US and Japan (pp 77-8). For General Technology Systems Ltd. (GTS), European collaboration was necessary for competition in the global market and Community funding acted as a catalyst (p 84). Other companies expressed a similar view (pp 81, 83, 86). The Economic and Social Research Council (ESRC) saw "a potentially unique role" for the Commission in developing a genuinely European research community (p 81). The Agricultural and Food Research Council (AFRC) and other witnesses stressed the importance of collaboration and co-ordination at a Community level (pp 68, 81, 86, 90, 102, 109, 113). The General Electric Company plc (GEC) said Community support for projects was particularly important in the United Kingdom, when support from the Government was less generous than in some other Member States (p 83).

30. Rather than revising the existing Framework Programme, the Commission has produced a new one, and the two will overlap for two years. But this was not of great concern to witnesses, who stressed that many individual programmes would carry over to the new framework anyway and that continuity and flexibility were more important than whether the Third Framework was new, or a revision. There was some evolution between the two (Q 16, pp 24, 69, 73, 82-4, 86, 114). The AFRC, however, said that the Commission had made no "clear case" for the proposed increase in funds between the second and third programmes; and the existing one should have been properly evaluated before more money was made available (p 69).

CRITERIA FOR EUROPEAN INVOLVEMENT

31. A number of activities were identified as most suitable for Community support. Professor Paolo Fasella, Director-General, Directorate-General XII, European Commission, identified (QQ 1, 12) a need for Community R & D on:

- (i) the development of common technical standards;
- (ii) solving trans-national problems (such as environmental problems);
- (iii) funding projects that were too costly for individual Member States to support unaided (such as thermonuclear fusion);
- (iv) developing the basic technologies necessary for industrial development.

32. The AFRC said (p 68) that to qualify for Community support, a project should meet one or more of these criteria:

- (i) it should lead to more rapid progress from the pooling of resources;
- (ii) it was of too great scale or complexity to be undertaken by one State;
- (iii) it was inherently international, involving overseas sites.

33. The Natural Environment Research Council (NERC) suggested that projects must have added value over and above what could be gained if they were limited to a national level. This could be done by building a "critical mass" of researchers across the Community, by providing large facilities or by focusing on specific problems (such as regional problems) (p 95). The University of Manchester's Institute of Science and Technology (UMIST) supported the principle of added value, and argued that projects receiving Community funding should complement national programmes to give continuity of purpose and should be genuinely European (p 106). Other witnesses broadly agreed, although some had reservations. The AFRC suggested that

concerted action "may not be necessary when good informal links already exist between scientists" and UMIST had had experiences where working with other countries led to a lack of effective progress (pp 68, 105).

HOW "NEAR THE MARKET" SHOULD THE COMMUNITY FUND RESEARCH?

34. There is no clear definition of which research is "basic", which is "applied" and which is "near market". The following definitions are given in an OECD publication known as the Frascati Manual¹:

Basic Research: "experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view";

Applied Research: "original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective";

Experimental Development: "systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to producing new materials, products or devices, to installing new processes, systems and services or to improving substantially those already produced or installed".

35. The Select Committee on Science and Technology, in their enquiry into definitions of R & D, concluded that, "The Frascati definitions may not be faultless, but they are internationally acceptable", although "strategic research" (that is, research in a subject area which has not yet advanced to the state where eventual applications can be clearly specified) should "for the purpose of national policy formulation" be firmly located within the Frascati definitions².

36. Professor Fasella suggested that "pre-competitive" (or "*préconcurrentiel*") research was research that stopped short of the market. The cut-off point, he said, was (in time) at least three years before a project was ready for the market or (in money) when one had to invest for the final development at least as much as one had invested until then. The Commission, he suggested, had to stop supporting research before it came "too near the market" because the competition rules of the Treaty (in particular, Article 92 on State aid) prohibited subsidy disguised as research funding. The Commission was keen to support "pre-competitive" research which provided the scientific and technical knowledge on which to base standards, a valuable contribution to the Single Market (QQ 39-41).

37. According to Mr. Foster of the DTI, much of the Third Framework Programme was concentrated on such research, an example being the inter-operability of networks with the overall aim of encouraging competitiveness. Mr. Hogg added that this was something that had been changed during negotiations "because they were getting rather close to the market in their concepts in the first technical annex" (QQ 91-4). On the other hand, Mr. Foster explained, in the "industrial areas", forming more than half the programme, the focus would be "very definitely" on strategic research, not basic research (QQ 105-6).

38. Some witnesses favoured Community involvement in basic research. Mr. Madron Seligman, MEP argued, "The Community's R & D Framework Programme should be strictly limited to basic and pre-normative and pre-competitive research". Such research was expensive and unlikely to attract private industrial shareholders. "If the State does not do this research, or at least help it, no-one will do it". Near market research should be left to industry (p 102). London University argued for a separate European programme of scientific and technological research at a fundamental level, designed to complement the applied research programmes which supported policy goals such as improving industrial competitiveness or the environment (p 89). Bristol University thought that the Commission did not give enough emphasis to basic research "from which all future applied and targetted research springs" (p 110).

39. As far as biology was concerned, however, the AFRC thought the Commission should fund applied rather than small-scale basic research (p 70). The Science and Engineering Research Council (SERC) recommended that the Commission should not become too involved in "curiosity-driven research", although a move away from the market was welcome (p 33). But Dr. Gordon Adam, MEP was "not convinced" that a move should be made away from the market.

¹ "The Measurement of Scientific and Technical Activities—Proposed Standard Practice for Surveys of Research and Experimental Development", "Frascati Manual 1980", OECD, Paris, 1981.

² Select Committee on Science and Technology, 3rd Report (1989-90): "Definitions of R & D" (HL Paper 44) paras 2.1-2.4.

"I think that Government, industry and all the people who are involved in research have to work as a team and make sure that the collective experience is brought into the market as effectively as possible" (Q 152). GTS said it was debatable whether basic research should be supported by the Community, or from national funds (p 85). GEC argued that basic research should be funded nationally and there was no objection to the Community funding near market research if the aim was to compete with Japan and the US. "The Japanese, in particular, have no inhibitions about helping their companies to dominate markets" (p 83).

40. Some witnesses considered whether the Community should primarily fund directed or reactive research, ie whether money should be available for specified objectives, or for responding to developments. Most EC funded research is currently directed (p 70) and no witness argued that this balance should alter fundamentally, although IBM did wish to see Community programmes sufficiently flexible to allow for reaction to new requirements as they emerged (p 87). Dr. Webb of Oxford University suggested that 25 per cent of funds should be available for reactive research in response to new developments during the life of the Third Framework Programme (p 116). The Medical Research Council (MRC) pointed to the benefits of collaborating with the Commission under "concerted action" procedures (see paragraph 22 above). This allowed projects to be developed from within the scientific community itself in response to perceived needs, and would ensure the high standards necessary to retain the credibility of the programme (p 93).

41. The consensus on these questions was that the balance of funding between projects of different kinds would necessarily vary according to the subject. A pragmatic approach was required (pp 74, 77, 82-3, 85, 93, 96, 115).

NON-SCIENTIFIC CRITERIA

42. The Framework Programme draws particular attention to the need to strengthen the economic and social cohesion of the Community and to nurture small and medium-sized enterprises (SMEs). According to the Commission¹, a small and medium-sized organisation (SME) is an organisation which fulfils all the following criteria:-

- (i) it has fewer than 500 employees;
- (ii) its net turnover is below 38 mecu; and
- (iii) it is not more than one third owned by a parent organisation or financial institutions.

43. Witnesses were divided on the importance of such non-scientific objectives. University College London (UCL) argued that "surely ... the European Framework is all about" strengthening economic and social cohesion and Bristol University argued that raising the scientific base in the less developed States was a good aim (pp 109, 111). Projects with such aims often produced useful results, GTS argued, and for the CBI any short-term loss of excellence could be balanced by greater integration in the long-term (pp 78, 86). British Aerospace argued "Some sacrifice in the level of excellence of programmes must sometimes be accepted in making an emphasis [on economic and social cohesion] and the acceptable level of this sacrifice must be a matter of judgment on a case by case basis" (p 75).

44. Dr. Webb commended the vigour and inventiveness of many SMEs (pp 116-7). UMIST favoured more financial support for SMEs than for larger corporations, to encourage participation and collaboration. SMEs could contribute innovation and "quality, scientific and technical excellence as well as flexibility". UMIST also thought that support for projects strengthening economic and social cohesion would lead to a growth in the number of SMEs (pp 107-8). GEC said SMEs could play a part without a loss of excellence and with the CBI identified a case for supporting SMEs undertaking near-market research (pp 78, 84). Dr. Adam noted the European Parliament's eagerness to encourage a technology application programme to back up R & D by SMEs. He hoped the Commission's proposed CRAFT programme would do this (QQ 125-6).

45. UCL, on the other hand, dismissed the "United Kingdom obsession" with SMEs as "largely political and rarely relevant" (p 109). GEC identified problems with mixing small and large firms in the same project (p 83). GTS suggested that the best help for SMEs would come from the independent research institutions (p 86).

¹ EC Research Funding: A Guide for Applicants, p 14.

46. Others stressed the over-riding importance of scientific excellence and pointed to the dangers of mixing up criteria. The MRC opposed supporting projects that could not be justified on scientific grounds (p 93). The SERC did not wish excellence to be compromised by confusion of objectives and, with the AFRC, argued that measures to support economic and social cohesion should be treated as such and funded from other sources-(pp 35, 71 Q 178 cf p 97).

LINES OF RESEARCH

47. There was general agreement that the six lines of research identified by the Commission were broadly right (pp 69, 73, 76, 82-84, 114). But the AFRC called for more research on plant molecular biology, neurobiology and immunology (p 69), while the ESRC argued that there was too much provision for technology and not enough for social science, which needed a parallel programme funded by the Community. This may well be because of the too narrow technical remit of Directorates-General XII and XIII (pp 80-1). London University agreed that there was a need for "increased emphasis" on social science research as, valuable though scientific and technological research would be in meeting the Community's policy goals, they would not be sufficient (p 90).

PART 4 EVIDENCE: FUNDING

BALANCE OF FUNDING

48. The overall balance of funding is set out in Appendix 4 table 3. Mr. Hogg was satisfied that the sums allocated were enough: the Government had in fact pressed for a reduction from the Commission's original proposal (set out in table 1, Appendix 4) (Q 83). But the CBI and GTS suggested that the funds were the minimum needed to maintain the "critical mass" of EC research and more could easily be justified (pp 77, 85). Dr. Adam thought that the Commission should have set the figure much higher (p 24). Professor Fasella put the Programme in context: about 3 per cent of the Community's budget was spent on research; and that only accounted for about 3 per cent of Member States' national spending on research (Q 1).

49. The Report of the Five Wise Men (see note 3, paragraph 5 above) suggested that Framework Programmes should either provide a "reserve fund" to be allocated at a later stage of the programme, or should become a series of "rolling" programmes, with a three year allocation of funds. The Commission opted for the latter, which the Council approved (p 77).

50. The balance of funding between areas of research has altered between the Second and Third Programmes, as set out in tables 2 and 3 in Appendix 4. One significant change is the drop in funding for energy. Professor Fasella argued that this was because energy research had started before other programmes. Furthermore, alternative energy sources were now approaching development, and the emphasis of nuclear power research was shifting towards waste management (QQ 18-19). Mr. Hogg added that the decline was connected with the end of the fuel crisis, and fusion research would continue to attract Community support. British Aerospace supported the cut in energy research (Q 133, p 74), although Dr. Webb saw a case for continuing research into alternative energy (p 114).

51. Funding for environment research has, however, been increased because of the need to tackle global problems on an international scale and to face up to the indirect costs of environmental damage. Support for environmental projects is accordingly spread throughout the Framework Programme (QQ 21-23).

52. British Aerospace argued that more support should be given to Industrial and Manufacturing Technology, where Europe was less advanced than it was in Information Technology on which much effort had recently been spent. GEC/Marconi welcomed the greater emphasis on materials and material processing, as the previous Programmes in the area (BRITE/EURAM) had been heavily oversubscribed (pp 74, 83).

53. Some witnesses suggested that setting aside a reserve fund for allocation after 1992 would provide greater flexibility in anticipation of new projects. The CBI suggested that 8-10 per cent of the funds should be put into such a reserve (p 78). NERC supported a reserve, but stressed the importance of long-term decisions and the AFRC saw no case for a reserve unless Member States had a "strong voice" on how it was used (pp 69, 96). But for the MRC, the phased allocation of funds meant that there was no need for such a reserve while GEC/Marconi saw long-term allocation of funds as the key to "confidence of stability" (pp 82, 92, cf 85).

ADDITIONALITY AND ATTRIBUTION

54. The terms "additionality" and "attribution" have already been discussed in paragraphs 23-27 above. The Treasury explained that it was a key requirement of Government policy that the public expenditure consequences of Community spending be controlled by the same system and principles as applied to all other public expenditure. The Treasury accepted that in the case of Community funds control "is a particularly complex subject which ... can give rise to confusion as to both concepts and terminology". The main source of confusion, the Treasury suggested, was that the controls varied according to whether receipts from the Community went to the United Kingdom public or private sectors. Receipts to the public sector came chiefly from the Community's Structural Funds and to avoid double-counting the expected level of such receipts was taken into account in the annual public expenditure survey, allowing departmental programmes to be set at higher levels than could otherwise be afforded (Q 203).

55. The Treasury told the Committee (Q 206) that in respect of the Structural Funds an explicit policy on additionality was unanimously adopted by the Community in 1988. This has already been set out in paragraph 24. Additionality in this field has, in effect, two strands: first, matching

contributions by Member States as an inherent part of Community schemes and without which receipts would not be triggered in the first place; and, secondly, the broader sense in which receipts from the Community led to additional public expenditure. In the Treasury's words, "additionality ... is secured at the stage when the levels of departments' programmes are established in the annual Public Expenditure Survey" (Q 210).

56. The main source of Community receipts for R & D projects in the United Kingdom private sector is the R & D Framework Programme. The Treasury explained that the United Kingdom's contribution to this, at about 20 per cent, reflected its contribution to the Community's budget as a whole. Returns were also about 20 per cent of the total, so that the United Kingdom was in this area of Community activity roughly breaking even. But although these flows were approximately equal, they were seen as amounting to a "significant transfer of resources from the public to the private sector", because the United Kingdom's contribution to the Community budget came from public funds; but receipts under the Framework Programme generally went to the private sector. The result was a substantial increase in United Kingdom spending on R & D. How far the resource transfer should add to planned public expenditure was a question again addressed in the Public Expenditure Survey and in this, as in all other cases, bids for additional expenditure above pre-determined levels were considered on their relative merits. The Treasury emphasised that the new Framework Programme would in any case lead to an increase of at least £250 million over the next seven to eight years in public sector support of United Kingdom R & D. Given that in anticipation of Community receipts, United Kingdom domestic programmes were established at higher levels than would otherwise be possible, the Treasury explained that when the receipts actually arrived, there was no further additionality, since this would amount to double-counting (Q 203).

57. In the case of the Structural Funds the scale and form of Community receipts were reasonably predictable, but in that of the Framework Programme, because the receipts went predominantly ("90 per cent or thereabouts") to the private sector, adjustments to departmental programmes were not made during the course of the Public Expenditure Survey, but only after the receipts had actually arrived (Q 248). The degree of relationship between Community receipts and the grant that might otherwise have been obtained from central government was taken as a measure of the United Kingdom's success in ensuring that Community programmes were broadly consonant with United Kingdom domestic priorities (Q 213).

58. The Treasury pointed out that central government had to consider how far Community receipts should constitute an absolute addition to the United Kingdom's R & D effort. They argued that it would be illogical for these receipts to be treated as wholly additional, because this would imply that there was no substitutability between Community and domestic money—"a recipe for waste and duplication". (Q 213) Broadly, however, the reduction in the flow of funds from central government was "very much smaller than the receipts". It also came only after a "rather lengthy time lag" (Q 264). The adjustment was applied between the Treasury and departments at the "global" level, but it was recognised that this led to a "sort of cascade effect", so that although there was "global additionality", a particular research institute could still find its budget reduced to the extent of its Community receipts (QQ 217-21). This could happen because of a mismatch between domestic and Community priorities, and it was specifically to cater for "glaring mismatches" that flexibilities were built in to allow cases at the margin to be considered on their relative merits and against all other such cases. The Treasury stated that "the way in which the rules operate ... will automatically ensure ... that for every pound of receipts ... at least 30-35 pence will be a genuine addition in resources" (Q 226-8). This measure of additionality, the Treasury suggested, applied only to the R & D case (Q 226), and they did not give a similar figure for the Structural Funds. The way in which the public expenditure implications of Community receipts were handled would make it "difficult to address" the question of what would have been done without such receipts (pp 66-7). Receipts from the Community were attributed to departments broadly in line with the latter's domestic responsibilities to provide "as far as possible that adjustments are made in the areas benefiting from the Community expenditure" (Q 227).

59. Professor Mitchell observed that the logic of the attribution system was impeccable. He was nevertheless concerned that it would in future extend from funds attributed to the DTI to those attributed to SERC, as the Commission shifted the balance of its involvement towards more basic science. His concern was that to secure Community receipts SERC would be required to undertake activities which previously it had decided not to pursue as being of lower priority than

other options: "decisions taken in which we have no formal representation would be transcending our priority views of things within our domestic budget" (Q 165).

60. NERC shared Professor Mitchell's fears about the possible future effect of attribution on the science budget. There was also a possibility of "double jeopardy"—i.e. loss of monies from the Science Budget under attribution and a further loss in topping up Community projects, since these were never fully funded, even where these projects were not a top priority for the United Kingdom. NERC suggested that to avoid this its input to Community programmes would have to be strong enough to ensure that Community and domestic priorities coincided, but there were limits on what could be accomplished since the United Kingdom was only one voice among twelve (pp 101–2).

61. MRC too saw the logic in the system of attribution. It allowed control over public expenditure and provided incentives to win back money for the United Kingdom. It also offered some restraint over the total size of European programmes and encouraged proper assessment and evaluation. But flexibility was needed (pp 94–5).

62. AFRC stressed that the concerns expressed by Professor Mitchell were common to all the Research Councils. In its experience, United Kingdom representatives at Community meetings had sometimes been isolated in arguing to keep costs down. AFRC thought this was because those Member States without an equivalent to the United Kingdom's Public Expenditure Survey system approached the question of increased Community activity from a different perspective, seeing it as a "means of gaining additional funding for the area of science for which they are responsible". AFRC thought there was a case for using the Science Budget only for international collaboration from which the United Kingdom could, if it wished, withdraw, as with projects such as CERN. The commitment to payments from which it was not possible to withdraw was a "quite unprecedented use of the Science Budget". If the attribution system were not to have a detrimental effect on United Kingdom science, then it would be necessary for the science budget to be "fully compensated" each year for EUROPE payments¹ (pp 71–72).

63. Questioned as to why Research Councils and universities felt unease at the implications of additionality and the apparent "claw-back" of funds, the Treasury suggested that there might be a misconception that the flow of funds from central government was reduced by precisely the resources obtained from the Community (Q 228). The Treasury were unable to say how other Member States handled these matters (QQ 241–2).

64. The Treasury believed that United Kingdom negotiators in Brussels had a clear idea of what the United Kingdom would like the Community to support, and they also felt that in recent years the United Kingdom had been fairly successful in moving Community R & D in its own preferred direction. But they recognised that Community membership of its nature must sometimes mean that decisions were taken which were not entirely consistent with United Kingdom priorities, a situation which they described as giving rise to "quite difficult decisions at the margins in relation to public expenditure control". (Q 253) The Treasury had made no special study of these matters, but felt that they were made aware each year of "areas where the shoe is pinching", and there was no question of public expenditure controls being applied mechanistically (Q 254). As they saw it, the incentive to the United Kingdom research community to seek Community money was "extremely strong indeed" since the operation of the existing rules would mean that if this money were not won, then there would be a real reduction in the flow of funds to United Kingdom R & D (Q 256). The Treasury acknowledged the distinction between discretionary expenditure, as in the case of CERN, and non-discretionary expenditure, as with the Framework Programme, but argued that since this applied across the range of public expenditure, there was no case for treating the contribution to Community expenditure on a different basis from other United Kingdom public expenditure (Q 263). Overall, the Treasury were in no doubt that the United Kingdom was presently practising additionality as construed by the Community, so there were no grounds for the Commission to deny the United Kingdom funds which would otherwise be made available. They therefore rejected criticisms made by the Court of Auditors (in relation to the Structural Funds) as failing to allow for the fact that, at least as far as funds destined for the public sector were concerned, the prospect of Community funds permitted departmental votes to be set higher than they would otherwise have been (Q 260).

¹ That is, payments under the system of Public Expenditure Controls applied to Community funds.

PART 5 EVIDENCE: EFFECTIVENESS OF COMMISSION PROCEDURES

STAGES OF COMMISSION INVOLVEMENT

65. Part 2 of this Report summarised how the support of R & D by the Community works. The Commission is involved at the following stages:

- (i) proposing a Framework Programme;
- (ii) proposing specific programmes;
- (iii) inviting applications of projects for support (the "call for proposals");
- (iv) selecting certain projects for support;
- (v) evaluating specific projects and programmes;
- (vi) evaluating the Framework Programmes; and
- (vii) dissemination of results.

66. Evidence to the Select Committee on Science and Technology¹ revealed some dissatisfaction with the bureaucracy of Commission procedures. This part of the Report considers each stage of the process in turn and sets out how far witnesses were dissatisfied with the Commission. It concludes with consideration of how any failings were thought to result from lack of involvement by scientists in the decision-making process.

PROPOSAL OF A FRAMEWORK PROGRAMME

67. Some areas of the Commission's proposal for a Third Framework Programme have been considered in Parts 3 and 4 above. Witnesses did not generally comment on the Commission's procedure in submitting its new proposal, except to welcome the decision to set up a new programme rather than revising the existing one (see paragraph 30 above). The NERC, however, criticised the short time between publication of the "Wise Men's" Report in June 1989 and the Council's final approval of budget lines and financial allocation in December that year. This precluded proper consultation with appropriate organisations in Member States (p 95).

PROPOSAL OF SPECIFIC PROGRAMMES

68. According to the SERC, "the rate at which new programmes are negotiated through the ... Council machinery does not always give sufficient time for thorough consultation" (p 35). Bristol University, on the other hand, found it "frustrating" when effort was made in submitting applications to a programme subsequently not approved by the Council, although the Commission's "communications" had improved (p 111).

"CALL FOR PROPOSALS"

69. Some found the application procedures complex and time consuming. Sometimes the deadline for submission of applications was too short and there were cases where more notice was needed, although GTS found that details were available sufficiently far in advance and the Commission was helpful to firms trying to find overseas collaborators (pp 35, 86, 108). UMIST offered three suggestions to improve matters.

- (i) a system of "pre-screening" to see whether a project was worth progressing to a full proposal;
- (ii) identifying large companies as "group or network project leaders" to help involvement by SMEs;
- (iii) programmes of seminars in regional centres on how to find and work with partners.

70. UMIST had begun a "sift of information" and had begun to take "a pro-active role" in finding industrial and academic partners. Such a system could be used both nationally and internationally (pp 108).

PROJECT SELECTION

71. Professor Fasella explained how the Commission selected projects for support. Applications were submitted to several "specialised referees selected from a fairly long list in conjunction with governments". Larger projects were also scrutinised by *generalistes* "to see how the project

¹ Select Committee on Science and Technology 1st Report (1986-87) *Civil Research and Development* (HL 20-I), paras 5.38-9.

fits in a broader frame". Potential users could also be consulted. Written reports were submitted to the Committee which assisted the Commission in selection (QQ 24-26). The SERC was critical of the process (at least in the field of biotechnology—the situation was different in other areas). "Too many applicants are stimulated to apply for limited resources with the result that much time is wasted by both applicants and the Commission". They suggested that a two-stage process involving pre-selection of initial draft proposals would be more cost-effective (p 34). Professor Mitchell, Chairman of the SERC, pointed out that only 15 per cent of biotechnology applicants were successful: a pre-selection process was one solution; a more complete definition of Programmes would be another (Q 179). The CBI identified a problem in the low success rate of applicants, which deterred SMEs and led to wasteful multiple bids by larger companies (p 77).

EVALUATION OF SPECIFIC PROJECTS AND PROGRAMMES

72. Professor Fasella explained that the Commission set "milestones" for projects and, halfway through a programme's life, evaluation was made by an independent panel, usually including an evaluator, a user and experts in the field. They had access to all documents and all research results. A report was produced and could lead to the interruption of the project if, for example, results were too far off (Q 26). He concluded that the Commission was looking for further improvements to evaluation systems—two aims were to set better terms of reference for programmes and to find better reviewers (Q 33).

73. Some criticised the Commission's ability properly to evaluate proposals at this stage. The ESRC said evaluation was "inadequate" and management was "variable ... and generally poor" (p 81). The AFRC called for more rigorous and regular evaluation, especially if the funds were to increase (p 70). UMIST criticised "the lack of an appraisal system with measurable criteria" (p 107). Mr. Hogg said there were some problems with evaluation: the Government supported the appointment of management consultants to look at monitoring. They were pushing Directorate-General XII to strengthen their evaluation unit, especially in establishing criteria for assessment and identifying testable objectives (QQ 45-46, 53). Dr. Adam drew attention to the MONITOR Programme for evaluation that the Commission and Parliament had worked out setting up the evaluation panels. Its effectiveness would have to be carefully watched. The European Parliament's Energy, Research and Technology Committee held meetings with the Chairmen of the Panels and, using their own Scientific and Technological Options Assessment Unit (STOA), examined the evaluation reports. This was all taken into account when the Parliament came to approve specific programmes (p 24, Q 123). The Parliament's role in evaluation (but not in selection) of projects was growing (Q 121).

74. Industry too contributes to the evaluation of projects. Companies attach great importance to this, especially where they have contributed up to 50 per cent of funds. GTS stressed the value of this involvement and commended the Commission for going "to great lengths to achieve competent and fair evaluation of projects" (p 85). The CBI wished to see a greater role for industry in mid-term review of projects (p 77).

Peer Review

75. The adequacy of "Peer Review" as a method of evaluation was considered by some witnesses. Peer review means that projects are evaluated by recognised independent experts in the field. Some argued that rigorous peer review of all projects was essential, but the list of experts had to be kept up to date (p 70, 92-3, 96, 109-10). Others, however, called for a broader basis of evaluation (p 74) either involving an international review body (p 116) or a Management Committee (p 96) or market forces (p 82). IBM drew attention to the list of additional evaluation techniques contained in the Cabinet Office's 1989 booklet "R & D Assessment—A Guide for Customers and Managers of R & D" (p 87). GTS suggested that peer review, if used in isolation from other evaluation methods, became too much like a club (p 85). GEC/Marconi called for the harsher judgments of the market place to be applied (p 82). The AFRC identified another problem—the Commission could make an "inappropriate choice of reviewers" (p 70).

EVALUATION OF THE FRAMEWORK PROGRAMMES

76. The CBI was broadly content with the Commission's evaluation of Framework Programmes, but wished to see a "clearer mission statement" (p 77). But the AFRC pointed out that the "Wise Men" had not consulted United Kingdom Research Council heads (p 70).

DISSEMINATION OF RESEARCH RESULTS

77. Mr. Thomas for the Department of Trade and Industry said that the Third Framework Programme would probably pay "considerably more attention" than before to the dissemination of research results. There would perhaps be some central direction, but "specific dissemination would still belong to the project managers of each particular project". The United Kingdom and other Member States were "particularly concerned" that results should filter down to SMEs (Q 108).

SCIENTIFIC INPUT

78. Some witnesses suggested that the Commission involved too many administrators and not enough scientists in drawing up and evaluating proposals. NERC called for a "better and more open involvement of working scientists" while the University of London said that too few United Kingdom scientists were involved and so programmes were often drawn up in accordance with political or departmental priorities, or those of industry (pp 88, 97). Several witnesses linked this to the problem of additionality (see paragraphs 59-60 above).

79. This raises the question of United Kingdom input into the agreement of Community R & D programmes at all stages. There is no doubt that United Kingdom officials, among others, were heavily involved in the detailed negotiations leading up to the final agreement of the Third Framework Programme. But there is no formal mechanism for the United Kingdom science community to make its views known in Brussels, although the Research Councils do have offices there and the AFRC pointed to the informal channels by which their voice was heard (p 72). NERC suggested that most of their input came at Council Working Group level, by which time it was too late. There was also a need to improve the Government's machinery for listening to Research Councils, as it was up to the Government to put their view across in Europe (pp 97, 100-1 cf QQ 151-54).

80. Professor Mitchell suggested that existing mechanisms would not be enough for an expanded programme. The Commission formulated its programme by "interaction" with individuals, but it "could just be a little more systematic". The existing CODEST Committee might need some "formal support" and the new-style Advisory Board for Research Councils "will have to be a coherent focus for these things which relate to United Kingdom Research Councils in relation to Europe" (QQ 186-7).

PART 6 OPINION OF THE COMMITTEE

THE IMPORTANCE OF THE FRAMEWORK PROGRAMME

81. There can be no doubt of the importance of R & D in ensuring the competitiveness of industry. Without adequate research and development, industry in the Community will fall behind its competitors in the United States and Japan, and the Community as a whole will suffer. The Committee accordingly welcome the Third Framework Programme as a contribution to the success of R & D in the Community. Even though Community funding is only a small percentage of national expenditure on R & D, it has a crucial role in encouraging cross border collaboration.

82. The Committee have no doubt that the Commission was right to propose a new Framework Programme even though the existing one is still active. But they are concerned that agreement of the proposal was hurried. They do not feel that the scientific community had enough time to have a direct impact on the Council decision. Some MEPs too feel that there was inadequate time for consultation. The Commission must bear some responsibility for this, for not allowing the "Wise Men" appointed to review the existing programme¹ enough time to do this as fully as they wished.

CRITERIA FOR SELECTION OF PROJECTS

83. Several witnesses outlined the criteria which projects should meet before being eligible for Community support under the Third Framework Programme. A general consensus emerged. The Committee consider that the Commission should only support projects which fall into one or more of these categories, each of which is discussed more fully in subsequent paragraphs:

- (i) they are directed towards the development of common standards;
- (ii) they aim to solve Community or international problems, such as those concerned with the environment;
- (iii) they are too costly for any one Member State to undertake;
- (iv) there would be added value in performing them at a Community rather than a national level.

In these four cases the test of "subsidiarity" is satisfied—the objectives can be attained better at Community level than at the level of the individual Member States.

84. Projects in the first category are essential to the single market. The Committee have previously identified the need for the Community to develop common standards, working where appropriate with countries outside the Community, for example for gas appliances² (to ensure a fair trade in safe products throughout the Community) and for air traffic control equipment³ (to ensure the compatibility of national systems). R & D projects which would contribute to such development should be given high priority in the run-up to 1992. It is also vital that standards which emerge from R & D Programmes are fully implemented by Member States and effectively monitored.

85. Projects in the second category include those addressed to problems which affect more than one State, such as environmental problems. There is a clear case for co-operation both between Member States and with non-Community countries⁴ on such projects. But the Community should watch for unnecessary duplication of work done elsewhere, particularly where problems which are inherently global need to be tackled at a world level. Research of this kind can thus be distinguished from research primarily aimed at improving the competitiveness of Community industry. There some duplication of, or competition with, work elsewhere is to be expected.

86. Projects in the third category include those to develop large facilities and research which is so long-term and costly that no one Member State is likely to undertake it. Thermonuclear fusion, for example, is an area where Community energy research must not diminish. But the

¹ See note 3, paragraph 5 above.

² European Communities Committee, 9th Report (1989–90): *Appliances Burning Gas* (HL 36), paragraph 18.

³ European Communities Committee, 12th Report (1989–90): *Air Traffic Control* (HL 41), paragraph 41.

⁴ The subsidiarity test, described in paragraph 83, is of course a formal pre-condition of Community action relating to the environment where this is taken under Article 130R and S.

Committee draw attention to the problems associated with the Joint Research Centre establishments¹. As the Community has come to realise, direction of large-scale projects needs to be better controlled to ensure value for money and positive results.

87. The concept of added value is more difficult to pin down. The Committee accept that it is hard to identify in advance what might constitute such value. One example might be a project leading to the development of a "critical mass" of research, with a snowball effect which could not have been achieved by the concentration of research in one Member State alone.

88. The Committee are more doubtful about Community support for projects aimed at the promotion of the Community's economic and social cohesion, or at the growth of small and medium sized enterprises, on which the Commission places some emphasis². In the context of research and development, the Committee think such objectives should always be clearly tested against the scientific and technical excellence of projects. The Community already has funds for promoting economic and social cohesion (such as the ERDF) and this aim should be supported from the appropriate funds. Small and medium sized enterprises on the other hand can contribute to the Community's research base and, provided that their contribution is of value, the Committee see no problem in Community support for projects which have, as a subsidiary goal, the encouragement of the work of such enterprises. The Committee are, however, aware that larger firms may face problems concerning their intellectual property rights when offering smaller firms a collaborative role.

89. The Committee intend to test all specific proposals for programmes under the Third Framework Programme against the four criteria outlined above. They urge the European Parliament, and the Council, to do the same.

NEAR MARKET RESEARCH

90. It is more difficult, however, to identify how "near the market" the Community should support projects. There is no clear dividing line to distinguish near market from other research and so flexibility is essential. The Committee cannot, however, accept the definition of "near market" research given in evidence by the Commission (see paragraph 36 above). The Committee furthermore recognise that the Commission has shied away from near market research both to avoid antagonising Member States who wish to leave such research to industry and because of problems of commercial confidentiality. But calls from industry to fund particular near market projects should not go unheeded and the Commission could respond in certain cases. The Commission has stated its intention to support demonstration projects—which are often near market—and should be encouraged to do so. There must also be good connections between programmes oriented to science and those oriented towards industry; and between projects under the Framework Programme and those under other programmes, such as EUREKA. If Member States refuse to fund near market research, and if industry (perhaps because of cost) does less than it should, then such research may suffer, to the disadvantage of the Community in competition with the United States and Japan. It is also desirable that in appropriate cases the follow-on development of technology, which is typically high-risk, should be recognised as still pre-competitive.

FUNDING

91. The Committee are satisfied with the overall budget for the Framework Programme. A case can always be made for more money, but that must be backed by assurances that money will be properly used. The Commission and the Member States may not have the resources and expertise available to put substantially larger sums to effective use. The balance of funds between the lines of research is also broadly right. Although the reduction in funds for energy is regrettable, the Community has done much valuable work in this field and the case for redirecting funds to emerging areas is strong. The need for environmental protection may, however, require a future adjustment in the funding available for energy research.

ADDITIONALITY

92. The Committee have considered carefully the evidence given by HM Treasury and others concerning the principle of additionality and the practice of attribution, defined in paragraphs

¹ These centres are listed in paragraph 22.

² In the recitals to the proposal.

23–27 above and considered in paragraphs 54–64. The Committee have concentrated on these issues as they arise in the United Kingdom because it is not clear what the practice is in other Member States, although the Committee are aware that both the Court of Auditors¹ and evidence to their previous enquiry into Transport Infrastructure² have identified particular Member States in addition to the United Kingdom where there have been criticisms concerning these issues.

93. The most disturbing aspect of the system operated by the Treasury is that it is not independently monitored. The Treasury has made a number of assertions—for example that, in anticipation of Community receipts destined for the public sector, departmental budgets are set higher than they would otherwise have been; and that 30–35 pence in every pound of Community funding for R & D is truly additional. But as such matters are dealt with under the procedures of the public expenditure survey, they are not open to scrutiny by Parliament or any other external body.

94. The Committee see two problems with the Treasury operating in this way. First is the Treasury's own claim that attribution is an "institutional" matter (p 66). The Treasury are treating the attribution of Community funds as if it were a matter solely for Whitehall. But any matter involving the United Kingdom's relations with the law-making machinery of the Community deserves scrutiny, notably by Parliament. Whether the arrangement is appropriate, in terms of domestic public expenditure, is also a matter for scrutiny by Parliament, most suitably by the House of Commons in its scrutiny of Departmental Votes. Such "internalisation" of the attribution of funds destined for projects supported by Research Councils also undermines the principles under which the Research Councils operate at arm's length from central government.

95. The second problem with the Treasury's system is that it can often seem to recipients of Community funds that a "non-additionality" principle in fact operates: their success in obtaining such funds will appear to lead to a subsequent cut in the budget of a Department from which they may also receive money, and possibly, via what the Treasury calls a "cascade effect", to a cut in their own receipt of United Kingdom public funds.

96. The Committee are grateful to the Treasury for attempting to explain the system in evidence before them, but a great deal of work still needs to be done to convince the Research Councils and universities that they will not be substantially disadvantaged by the operation of attribution. In fact, there is no general understanding of how the system operates—or even recognition that it operates at all. The Treasury must make good this failure to communicate, perhaps by organising a series of meetings at the key centres of research across the country.

97. In addition to doubts about the Treasury's explanation of additionality and attribution, the Committee are seriously concerned by the system itself. The Treasury appear not to have taken into account how little they are able to shape policy in Brussels and are insufficiently sensitive to the limited influence the United Kingdom can have there, as only one voice among twelve. They do not appear fully to recognise that as successive Framework Programmes become more important, existing public expenditure controls may lead to a growing distortion in the Science and Technology budget, despite the best efforts of industry, the universities and the Research Councils. One example would be when a university receives Community Funds for a project, but subsequently finds that central Government funds for a project judged to be of higher priority nationally are cut. Thus the science community's ability to set priorities for projects could steadily diminish.

98. Secondly, there are doubts about the effective level of additionality of Community funds. The Treasury suggested that in the case of R & D, 30–35 pence in the pound is truly additional, but have given no evidence to justify their choice of this, or any other particular figure. The Treasury should produce such evidence, if the figure is not to seem completely arbitrary. The Committee are also concerned that according to the Treasury³, this is a "global" figure, which implies that for some projects, no Community funds are truly additional.

99. The Committee also note that this figure was given in relation to those funds primarily going to the private sector, as much of the money under the R & D Framework Programme will do. They find curious the Treasury's decision that, for these purposes, the private sector includes

¹ See paragraphs 23–27 above.

² European Communities Committee, 21st Report (1988–89), *Transport Infrastructure* (HL Paper 84), paragraph 63.

³ See paragraph 58 above.

the universities. They are also concerned that the situation may well be just as bad in the public sector, for which the Treasury has produced no comparable figure for the level of Community funds which are truly additional. But there is at least one particular case in the public sector where the level of additionality is unsatisfactory. That is reflected in the Court of Auditors' Report, which concluded that Community aid for transport infrastructure in the United Kingdom was treated as "appropriations in aid" of the Department of Transport Vote (see paragraph 27 above).

100. One final unsatisfactory feature of the present system is that the Treasury have not interested themselves in how other countries handle these matters. While there may be little occasion in general for the Treasury to be aware of foreign practices in regard to public expenditure controls, the case is altered when practices in other countries bear on circumstances in the United Kingdom, as happens with the Framework Programme. The Committee urge the Treasury to remedy this situation by investigating practices elsewhere insofar as they touch on the additionality question, and to publish the results.

101. The Committee believe that these matters have not been previously so fully ventilated before a Committee of Parliament. The confusion and worries brought out by the evidence to the Committee are likely to grow as Community Programmes including the Framework Programmes increase in importance. More importantly, the Committee strongly disapprove of the Treasury practice of, on their own figures, only allowing 30-35 pence per pound of Community funds for R & D to be truly additional. There is clear evidence that R & D in the United Kingdom is already under-funded, as the Select Committee on Science and Technology have pointed out¹ and the Treasury's policy only makes matters worse, thus operating against the national interest and the needs of industry. Although the Committee accept that Community funds may not be 100 per cent additional, the present figure is clearly far too low.

102. These and other problems inherent in the Treasury's operation of additionality and attribution have implications far wider than the Framework Programme and R & D, and raise more general questions about the Treasury's attitude to Community funds which this report has not been able to cover. They must be urgently addressed.

COMMISSION PROCEDURES

103. The Committee are aware of evidence that Commission procedures are sometimes cumbersome and bureaucratic. This can be a particular problem in the call for and selection of proposals. A lack of efficiency here means that many enterprises waste time and money in preparing proposals under programmes which are in the end very heavily over-subscribed. The Commission does seem to be aware of such problems, but there is a need for a system of "pre-screening" of draft proposals to see whether they are worth progressing to a full project proposal. This should take place before proposals are formally submitted. It would also help applicants if the selection criteria were clearly and simply spelled out, so that applicants whose projects were well outside the subject scope of programmes would be deterred from applying. This would help increase the success rate of applications which is, according to the SERC², absurdly low in some areas. But there may well be difficulties in setting out selection criteria for research that is fundamentally new.

104. Commission evaluation of specific projects and programmes was criticised by some witnesses. For any system of R & D funding to work, it must have—and be seen to have—effective procedures for keeping projects to plan, for closing down projects not proven worthwhile, and for redirecting funds to more promising areas. Such procedures provide a healthy discipline for successful applicants.

105. The Committee accordingly welcome the Community's MONITOR Programme for project evaluation and hope that the Commission will act firmly on the results of the evaluation panels the programme will set up. There is also a need for the Commission clearly to specify testable performance objectives for projects and to work towards uniform standards of evaluation across the Community. The Committee recommend that about 1 per cent of Community funding for individual projects should be set aside for evaluation. This is in line with a similar recommendation made by the Select Committee on Science and Technology for United Kingdom Government R & D expenditure³.

¹ Science and Technology Committee, 1st Report (1986-87), *Civil Research and Development* (HL 20), para 7.3.

² See paragraph 71 above.

³ Science and Technology Committee, 1st Report (1986-87), *Civil Research and Development* (HL 20), paragraph 6.116.

106. The Committee have not conducted a thorough review of the methods of evaluation available to the Commission. There are many ways of evaluating R & D—ranging from peer review to quantitative methods based, for example, on the number of publications or extent of results from a project. The Committee are, however, satisfied that peer review is the basic evaluation method the Commission should use. But the Commission should be rigorous in ensuring that its lists of referees are kept up to date and that new researchers are allowed to participate. This will allay the fears of those who see a danger that peer review is carried out by members of a cosy club. The Commission should also pay the closest attention to industry's evaluation of the projects it is involved with. Such evaluation will often provide a rigorous test of "value for money" and will thus be an essential complement to peer review.

107. The European Parliament too has a role under the EEC Treaty in monitoring the Community's specific R & D programmes, all of which must be approved by the Parliament under the co-operation procedure. If the Parliament's powers and functions are to expand, it is clear that more scientific expertise needs to be made available to its Members.

108. Some witnesses raised the question of scientific input into the Community's procedures. The Committee consider it is vital for several reasons that there are strong links between the scientific community and the Commission. First, the European Community's involvement in R & D continues to grow and increasing resources must be properly targetted to meet scientific objectives. Secondly, the opportunities for cross-border collaboration on R & D projects will grow as the Community expands, whether that expansion comes in the form of extended membership or of increasing co-operation within a "European Economic Space". Thirdly, given the serious problems about the United Kingdom's attitude to treating Community funds as additional, it is clearly desirable that the Community directs its funds to priority areas identified by industry and the scientific community.

109. There are several ways in which scientific input can be improved. First, the Commission should employ more scientists, as the Select Committee have previously recommended¹. The Committee would welcome an assurance that recruitment procedures are sufficiently flexible to attract scientists to all levels of administration.

110. Secondly, the Commission must take account of the views of the United Kingdom's Research Councils. The Research Councils have worked hard to establish informal links with the Commission, but there may be a case for a formal relationship between the Commission and the scientific community in all the Member States. One way to achieve this would be to increase the representation of the scientific community on the various Community Committees². The Research Councils should be formally represented on the respective Advisory Committees such as CODEST. At present, the members of CODEST are chosen on an "ad hominem" basis and do not formally represent any official body. This can lead to problems with the transparency of their work. The Committee suggest that such Advisory Committees could, if their work is more transparent, provide an appropriate focus for the "peer review" of specific programmes which the Committee have recommended³.

111. There is also a case for formal representation of the Research Councils on the Management Committees which are to control the financing of each programme. The Committee accept that representation on such Committees is at present confined to government officials, but suggest that additional members could be appointed from industry and the scientific community. The Committee cannot as yet suggest what role the reformed Advisory Board for the Research Councils should play, but the ABRC seems more suited to giving strategic guidance than to becoming involved in day to day negotiations in Brussels.

112. Thirdly, the Commission should pay close attention to technical innovations by smaller businesses. Many larger corporations have sufficient resources to make their views known, but the voice of the small company is often not properly heard. The Committee accordingly welcome the Commission's establishment of "Euro-Info Centres" in the Member States and recommend that these act in both directions, both offering advice on how to participate at a Community level and reporting back to the Commission the concerns and ideas of all interested parties.

¹ European Communities Committee, 11th Report (1987-88), *Staffing of Community Institutions* (HL Paper 66), paragraph 158.

² See paragraphs 12-14 above.

³ See paragraph 106 above.

PART 7 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

113. The Third Framework Programme is a welcome contribution to Community competitiveness, although its agreement was somewhat hurried (paras 81–82).

114. Projects should be approved under the Programme if:–

- (i) they are directed towards developing common standards; or
- (ii) they aim to solve international problems; or
- (iii) they are too costly for any one Member State to undertake; or
- (iv) there would be added value in performing them at Community level (paras 83–87).

115. Where a programme is intended to promote the economic and social cohesion of the Community, or to encourage the growth of small and medium sized enterprise, these non-scientific objectives should be clearly tested against scientific and technical excellence (para 88).

116. The Community must be able to undertake near market research where appropriate, such as in funding demonstration projects. But the Committee cannot accept the definition of “near market” research given in evidence by the Commission (para 90).

117. The overall level of funding under the Programme is satisfactory as, in general, is the split between the various lines of research (para 91).

118. Treasury handling of Community funds under the system of attribution is not satisfactory because:

- (i) it cannot be independently monitored by Parliament or any other external body (paras 93–94);
- (ii) it can lead to applicants who successfully bid for Community funds having their central government grant cut (para 95);
- (iii) it has not been clearly explained to interested parties (para 96);
- (iv) the system could accordingly lead to a distortion in the priorities of the scientific community (para 97); and
- (v) universities are treated as being within the private sector (para 99).

119. In working to remedy these defects, the Treasury should produce evidence to support their claim that 30–35 pence per pound of Community R & D funds are truly additional. They should also mount a series of meetings to explain the system and should study the practice in other Member States and publish the results (paras 98–100).

120. More importantly, the system operates against the national interest and the needs of industry as it only makes worse the under-funding of R & D in the United Kingdom. Community funds may not be 100 per cent additional, but the present figure is clearly far too low (para 101).

121. Additionality and attribution raise more general questions about the Treasury’s attitude to Community funds which this report has not been able to cover. The problems identified here must be urgently addressed (para 102).

122. The European Commission is aware of defects in its procedures for selecting R & D projects. A system of “pre-screening” is needed (para 103).

123. The Commission is also working to improve evaluation. “Peer review” remains the best form of evaluation, but lists of referees should be kept up to date and peer review should not be used in isolation. 1 per cent of funding for individual projects should be set aside for evaluation (paras 104–107).

124. Scientific input into Community decisions could be improved by:

- (i) the Commission employing more staff who are scientists (paras 108–109);
- (ii) the Commission paying more attention to the industry and the scientific community: in particular, the Research Councils should be formally represented on the Commission’s respective Advisory Committees and individuals from science and industry should serve

on Programme Management Committees alongside Government representatives (paras 110–111); and

- (iii) the Commission discovering—and acting upon—the concerns and ideas of all interested parties, in particular technical innovations coming from SMEs (para 112).

RECOMMENDATION

125. The Committee consider that the Third Framework Programme for R & D raises important questions to which the attention of the House should be drawn, and they make this report to the House for debate.

APPENDIX 1

Sub-Committee B (Energy, Transport and Technology)

The members of the Sub-Committee which conducted this enquiry were:

V. Chilston
L. Ezra
L. Gorell
L. Gregson
V. Hanworth
L. Ironside
E. Lauderdale
B. Llewelyn-Davies of Hastoe
L. Lloyd of Kilgerran
L. Lucas of Chilworth
D. Portland
L. Renwick
L. Rodney
L. Shepherd (Chairman)
B. Stedman

The Sub-Committee are grateful to the following members of the Select Committee on Science and Technology who assisted them during the enquiry:

L. Butterworth
B. Lockwood
L. Sherfield

The Specialist Adviser was Professor Roger Williams of Manchester University.

APPENDIX 2

The following witnesses gave evidence. Those marked * gave oral evidence.

- *Dr. Gordon Adam, M.E.P.
Agricultural and Food Research Council
British Aerospace
Confederation of British Industry
- *Department of Trade and Industry/Cabinet Office
Economic and Social Research Council
- *European Commission
GEC/Marconi
General Electric Company plc
General Technology Systems
- *The Hon. Douglas Hogg, M.P.
IBM
London University
Medical Research Council
Natural Environment Research Council
- *Science and Engineering Research Council (Professor E W J Mitchell)
Mr. Madron Seligman, M.E.P.
- *Mr. James Spence
- *HM Treasury
UMIST
University College, London
University of Bristol
University of London (Dr E W Thompson)
University of Manchester
Dr. C J Webb

APPENDIX 3

QUESTIONS TO WITNESSES

1. How far is a European programme for R & D desirable at all? Which are the areas where collaboration between the Community and Member States will be most beneficial? Are the six areas identified for Commission support the right ones?
2. What value is such a vague Framework programme as proposed, which gives almost no detail on the scope of particular projects to be covered?
3. Is the Commission right to propose a new programme rather than revising the existing programme?
4. Has the Commission adequately justified the resources to be made available?
5. Is the balance of funding between areas correct? In particular, is the Commission right to reduce support for projects concerned with energy?
6. Does the long-term nature of R & D mean that the Commission is correct to set out funding over the four year life of the projects now? Should decisions about financing after 1992 be taken when it is clearer what budgetary arrangements will apply then? Should a portion of the budget allocation for the programme be set aside as a reserve to cover financing of new projects that may be deemed necessary when the programme is revised in 1992?
7. Does the proposal give sufficient weight to the need for evaluation of projects?
8. How far does the new programme differ from the existing one? Has the Commission sufficiently justified the changes?
9. In setting up programmes, is the Commission really clear about its priorities as to
 - (a) the balance between research and development;
 - (b) the balance between basic and applied research;
 - (c) how "near the market" it is proposing to fund projects?
10. The Commission has so far failed to review the existing framework programme. Is evaluation an essential element in research programmes? Does the Commission have adequate procedures to evaluate programmes and is it able to ensure that those of little worth are closed down? Are you satisfied with "peer review" as a method of evaluation?
11. How far should research funded by the Community be directed research rather than reactive research?
12. Is the strengthening of European competitiveness a sufficient justification for the Community undertaking research already underway elsewhere in the world? Does the increasing number of areas of Community activity mean that there will be a growing need for research in new areas?
13. Are the details of the projects settled sufficiently far in advance? Is it of concern that the Commission has been able to start new projects without political backing? Do you have any comments on the aeronautics programme agreed last year?
14. Should the Commission give emphasis when supporting particular projects to those which strengthen the economic and social cohesion of the Community and which encourage the role of small and medium sized enterprises? If so, can this be done without sacrificing the level of excellence of programmes?

APPENDIX 4

Table 1 Commission Proposal¹ for a Third Framework Programme 1990-94

Subject	Sum Available (mecu)
I. Enabling technologies	
1. Information and communications technologies	3,000
2. Industrial and materials technologies	1,200
II. Management of natural resources	
3. Environment	700
4. Life sciences and technologies	1,000
5. Energy	1,100
III. Management of intellectual resources	
6. Human capital and mobility	700
	<hr/> Total 7,700 <hr/>

Table 2 Second Framework Programme 1987-1991

Focal areas	Sums in million ECU		Proportion of total budget (%)
		Total	
1. Quality of life:		375	6.9
1.1 Health	80		
1.2 Radiation protection	34		
1.3 Environment	261		
2. Towards a large market and an information and communications society:		2,275	42.3
2.1 Information technologies	1,600		
2.2 Telecommunications	550		
2.3 New services of common interest (including transport)	125		
3. Modernisation of industrial sectors:		845	15.6
3.1 Science and technology for the manufacturing industry	400		
3.2 Science and technology of advanced materials	220		
3.3 Raw materials and recycling	45		
3.4 Technical standards, measurement methods and reference materials	180		
4. Exploitation and optimum use of biological resources:		280	5.2
4.1 Biotechnology	120		
4.2 Agro-industrial technologies	105		
4.3 Competitiveness of agriculture and management of agricultural resources	55		
5. Energy:		1,173	21.7
5.1 Fission: nuclear safety	440		
5.2 Controlled thermonuclear fusion	611		
5.3 Non-nuclear energies and rational use of energy	122		
6. Science and technology for development:		80	1.5
7. Exploitation of the sea bed and use of marine resources:		80	1.5
7.1 Marine science and technology	50		
7.2 Fisheries	30		
8. Improvement of European S/T co-operation:		288	5.3
8.1 Stimulation, enhancement and use of human resources	180		
8.2 Use of major installations	30		
8.3 Forecasting and assessment and other back-up measures (including statistics)	23		
8.4 Dissemination and utilization of S/T research results	55		
Total		<hr/> 5,396 <hr/>	<hr/> 100.0 <hr/>

¹ Com(89)397 (8375/89) Annex 1.

Table 3 Third Framework Programme 1990-1994 as agreed

Focal areas	Sums in million ECU		Proportion of total budget (%)
		Total	
I. Enabling technologies			
1. Information and communications technologies:		2,221	38.9
— Information technologies	1,352		
— Telecommunications	489		
— Development of technological systems of general interest	380		
2. Industrial and materials technologies:		888	15.6
— Industrial and materials technologies	748		
— Measuring and testing	140		
II. Management of natural resources			
3. Environment:		518	9.1
— Environment	414		
— Marine science and technology	104		
4. Life sciences and technologies:		741	13.0
— Biotechnology	164		
— Agricultural and agro-industrial research (incl. fisheries)	333		
— Biomedical and health research	133		
— Life sciences and technologies for developing countries	111		
5. Energy:		814	14.3
— Non-nuclear energies	157		
— Nuclear fission safety	199		
— Controlled thermonuclear fusion	458		
III. Management of intellectual resources			
6. Human capital and mobility:		518	9.1
Total¹		5,700	100.0

¹ Including ECU 57 million for the centralised management of the dissemination and exploitation of research results and ECU 550 million for the Joint Research Centre (JRC).

MINUTES OF EVIDENCE

TAKEN BEFORE THE EUROPEAN COMMUNITIES COMMITTEE
(SUB-COMMITTEE B)

WEDNESDAY 29 NOVEMBER 1989

Present:

Butterworth, L.	Renwick, L.
Lauderdale, E.	Rodney, L.
Llewelyn-Davies of Hastoe, B.	Shepherd, L. (Chairman)
Lucas of Chilworth, L.	Sherfield, L.
Portland, D.	

Examination of witness

Professor PAOLO FASELLA, Director General, Directorate General XII, European Commission, examined.

Chairman

1. Professor Fasella, I extend you a warm welcome to the Committee. It is a mix of our normal Sub-Committee and some members of the Science and Technology Committee who will help us through this inquiry. I think you will know that the House of Lords has always shown a very great interest in research and development, and some members have sat on some of the United Kingdom research councils. As a consequence the House of Lords is able to keep itself very well informed of developments within the United Kingdom. However, it is true to say that we have very little information as to what is going on within the Community in the sense of how successful it has been, what benefits have accrued and what the difficulties may be. In inviting you to make a statement on behalf of the Commission, I wonder whether you could give us some information on past programmes, and whether you might consider providing the Committee with a written paper. May I again thank you for coming and invite you to address the Committee and bring us into the picture if you can?

(*Professor Fasella*) My Lord Chairman, as you can see, I cannot say I stand in awe, but I sit in awe. This is coupled with a very strong interest. Being a Community civil servant I have to appear before national parliaments, but on the basis of previous experience—in particular the visit that a Committee of the House of Lords paid to Brussels about two years ago—we in Brussels find that the House of Lords is quite different. Most of all, and this is very important in an area like research, you generally look at problems with a broader time perspective and perhaps also space perspective. This is very important in research, as I said. I hope that this session—and the paper that your Lordships have suggested we might prepare for you, which we will do willingly—will be a source of information to you and a source of education for me because the possible

questions of which the Clerk gave me some indication are indeed very penetrating. As you know, we are now discussing the third framework programme, which would cover the period 1990–94. This is really the first framework programme that has been conceived not only on the basis of results and evaluation of previous framework programmes, but after the Single European Act was adopted. In some way, therefore, it is the first real framework programme; the others were attempts while learning the way. That is also why I think this will be a very important one. As you know, the Single Act gives a mandate to the Community to include scientific and technological research as part of its policies in connection with industrial development and competitiveness. Thus scientific and technological research is a basis for competitiveness, but upstream in respect to firms' and industry's responsibility. In implementing this mandate a criterion that the Commission has proposed and the Council and Parliament have strongly confirmed—as an English word I think it perhaps does not exist in the Oxford Dictionary—is subsidiarity. This means in real terms that the Community should try and do things only when this seems to be the most practical and the best way; whatever can be done at the local, national or bilateral level should be left at that level. The Commission should intervene in making proposals and the other bodies in adopting them only when there is a recognised usefulness in doing it at the Community level. A practical consequence of subsidiarity is that if one looks at the resources allocated to research activity now, that is, those at present in the framework programme, they are coherent with the notion of subsidiarity. As of now they represent about 3 per cent of the total public expenditure on research. It is not trivial: as of now the budget is 1.5 billion ecu per year. It is, therefore, a substantial sum of money, but still it represents only 3 per cent of the expenditure for research in the 12 countries concerned. One could say it is subsidiarity in action. Similarly, it

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Professor PAOLO FASELLA

[Continued]

[Chairman Contd]

represents about 3 per cent of the Community's own budget. I think this is not so different from the public expenditure for research in the United Kingdom which, according to the latest report, is 2.9 per cent although that includes defence, which in your case is very important. That sets the frame. Given limited resources—though still large enough to require accountability in terms of results, not only in respect of the correctness of management—the criteria for making the choice have become very important. They have been developed on the basis of practice, common sense and the work set down by the German Minister for Research, Dr Riesenhuber, when a previous framework programme was adopted. I think that you are familiar with them, my Lord Chairman; I wonder whether it is worthwhile repeating them. I start—because it is becoming more important as we approach 1992 and 1993—with research which gives scientific and technological knowhow on which reasonable regulations, norms and standards may be based when they are needed. I think it is important that the Community as a whole has the best scientific basis for that and it makes sense to develop that together. If we had 12 different norms in the market area, we would hardly have a true large, common market. Before I became a Community official I served as a national representative on committees dealing with pharmaceutical products. The “not invented here” syndrome was very important among all us scientists: it was very difficult for officials in Bonn to accept something invented in Paris, for instance, and vice versa. Since things are moving fast, if we begin working together from the beginning it will not be much easier, in fact, but it will be less difficult to have common norms and standards which I think we need in a number of areas. That line of research, which is directly related to Community tasks that are becoming more important in the run-up to 1992 and with the increased sensitivity over and concern for the environment, is becoming more important. The other area is to tackle problems which by their very nature are trans-national. Some problems connected with the environment, for example, cannot be examined at the national level. In some cases they cannot even be considered at a continental level. Even in relations with other countries to have, for the European continent, some joint tightly connected programmes is a necessity. A third area is when the scope of the action is so interesting yet so large that it would be too expensive not only in terms of money but also in terms of personnel and brain commitment to tackle it alone. I think that controlled nuclear fusion is such a case. It is an insurance against the future, and I think Europe is doing all right. We are shortly going to Vienna to meet the Russians, the Japanese and the Americans who as of now are already working in a Community laboratory in Garching to prepare for the future and share costs.

Lord Rodney

2. Where is that?

A. This programme is called ITER; it is an acronym and in Latin means “the way”. It stands for International Thermonuclear Test Reactor. Since

the next step will probably be quite expensive it seems reasonable, if the present international climate holds, to tackle it together. That is why approaches were made between Europe, the Americans, the Japanese and the Russians. We have a team made up of these last three countries and indeed Canada, which participates as an honorary European. (This is one of those bizarre cases—though perhaps not so bizarre when one is in London!) I think that it is doing all right. Eventually it was decided to place this group of scientists in Europe because, although it is not a dog race, I think we are slightly ahead, especially with the main laboratory here in Culham.

Chairman

3. Who made the decision to set up this organisation? Was it the Commission or did it require ministerial approval by the Council of Ministers?

A. The participation of the Community in collaboration with third countries follows a specific pattern that is now spelt out in Article 130N and Q(b) of the Treaty. The Commission may begin to have feelers. On that basis, after informal, unofficial and fully reversible contacts, it goes to Council and Parliament saying, “May I, Commission, negotiate an agreement on this basis?”. Council in consultation with Parliament decides and eventually gives the Commission a mandate, on the basis of which the agreement is negotiated. Following that, the final text goes back to Council and Parliament, who authorise the Commission to sign.

Earl of Lauderdale

4. Has it gone back to Council and Parliament yet?

A. Indeed, yes, it has been running for one year.

5. Is this for studies that one might say are post-JET/post-Culham?

A. Absolutely, yes. We had some success because the terms of reference adopted for ITER coincide pretty closely to what I think the Community experts had in mind.

Lord Sherfield

6. While we are on the point of ITER and NET, the European NET programme and the ITER programme are working side by side at present, are they not?

A. The difference is very small. The whole Community ITER team is in Garching.

7. So is the NET team?

A. Yes, so is the NET team. The NET team participates in ITER so that it has been possible not to increase the financial demands for NET because one had the contribution of the ITER team.

8. Is the prospect that the two teams will become one quite soon?

A. They practically work together so they are pretty close to being one already. Formally there is the NET team and the ITER team, but it is difficult to distinguish between them.

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Professor PAOLO FASELLA

[Continued

Earl of Lauderdale

9. Are they both in Garching?

A. Yes, they are. We meet for political meetings in Vienna to satisfy the International Atomic Energy Agency.

Lord Sherfield

10. Is this project separate from the framework programme or is it included in the programme?

A. The participation of the Community in ITER is indicated in the framework programme.

Earl of Lauderdale

11. And NET?

A. And NET, yes.

12. They are both in the programme?

A. Yes. NET is the contribution of Europe to ITER, one would say. It is not too difficult for us to do this because the other three accept working in our laboratory.

There is another criterion: developing those basic technologies which are needed for our development and which are very pervasive and often require complementary skills. In a way modern science and technology is much more integrated. Each of us is very much more dependent on others. One cannot be a good clinician sometimes without an NMR machine provided by the engineers and the theory provided by the physicists. One could go on for ever. It is, therefore, much more tightly coupled. More and more progress—in fundamental and applied science and technology—proceeds very much by components and assembly. It is a little like the game I had when I was a child called Meccano: one had many pieces and one could make cranes or automobiles. The creativity of the engineer put the things together, but still one needed the pieces. One could say that each of us—whether his interest is in particle physics in CERN or elsewhere—needs many components from industry, and expensive components too. This is increasingly true. The spectrum of components available is so large that even if one takes the strongest of the individual European countries they cannot provide them all. In a field that is close to my own—that is, before I came to Brussels—molecular biology applied to industry, there was an excellent report by the German firm Hoechst to the German Ministries of Agriculture and Science and Technology. Germany has the largest research budget in Europe, investing a higher percentage of the GNP than the United States. One sees at all levels how strong they are, but even Hoechst—and it is not the smallest of firms—indicated what were the gaps in Germany. Therefore, I think we must have these programmes to make people know each other and plan projects together in which each contributes one part and combined they form a larger whole. There are also side effects, especially for the industrial side, which, according to what the companies themselves say, are as important as the research. Through these programmes, companies—men and women—begin to sound each other out. A company in Germany may be considering, "Shall I

or shall I not go into a joint venture with a Spanish company because I would have a greater access to the market and they can produce some of the things there?" Before they go into the real market, which involves larger amounts of money and so on, they do not mind having some contacts in an upstream project whereby they can weigh each other up as to which partners they could work with and those with whom they would prefer not to repeat the experience. This is, I think, an indirect but far from trivial result in preparation for 1992. Then there are cases in which an analysis of the situation shows that there are clear gaps in important fields. Perhaps I may again give an example in the field of biology, which I understand best. When we started with the very first framework programme, which was still a tentative one, the agricultural problems were even more serious than now—with the new policy and budget discipline, the situation is better under control—and it was clear that European agriculture had to be reorientated towards self-sufficiency from the economic point of view. We developed a programme with an acronym that was eventually turned down because it was said that it sounded African and was provocative. The acronym was TAMDA. Towards a Market-Driven Agriculture, and it was considered provocative. Before doing this we tried first to see whether there was anything really new to apply to agro-industrial problems. That was in 1981–82. I myself was rather familiar with other European ventures in molecular biology, having been quite deeply involved with EMBO, which essentially distributes scholarships, runs workshops and so on and has been fairly successful. EMBO had chosen to concentrate more on animal, bacterial and classical cell biology but had done relatively little on plants. Before trying to launch an expensive applied programme, we thought we should avoid the mistake that had been made by Lysenko in the Soviet Union in trying to do genetics while increasing wheat production. One has first to know the rules of the game from the scientific point of view before one applies them. We thought it was worth starting rather small, so we started very low with an 8 million ecu programme which concentrated on putting together the few but good laboratories that were active in plant molecular biology and gave them a little support (they were not very fashionable with their own governments) with scholarships to train people so they could go back and forth. Progressively some key results were obtained, including finding vectors for foreign genes and control of foreign gene expressions in both monocotyledonous and dicotyledonous plants; and on that basis we built an agro-industrial programme, but it took five years.

Chairman

13. If one puts it very shortly then, you were acting in this respect rather like a marriage broker?

A. Yes, absolutely. That is quite right.

14. And you have a dowry that in time will cement the arrangements?

A. Yes, I think you put it very clearly, my Lord Chairman. There is a last point I want to make which I think may be important even though it is not

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[Continued]

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included in the possible questions indicated by the Clerk of the Sub-Committee. I think that the people who run things are perhaps as important as, and possibly more important than, the abstract rules and laws. As you know, the people who run research in Brussels are mostly distributed between DG XIII, which handles information activities and telecommunications, DG XII, which does more or less the rest and the Joint Research Centre, which does some direct in-house research. We are, however, very tightly coupled. Of course I know more about the directorate general for which I am responsible, that is, DG XII. It is interesting that most of these people are hired on a limited time basis. Etienne Davignon, who was my first chief in the Commission, before he left persuaded the other commissioners that research personnel had to be handled in a different way. We always work in collaboration with DG IX, which handles regular *fonctionnaires*, but we have direct responsibility, in particular as regards special competitions and selection procedures. It was decided not to hire persons for a period longer than the duration of the programme. There is, therefore, a high degree of mobility—even too much. On average since I have been here we have 20 per cent per year. This is not something we have to enforce. Most of our activities are trans-disciplinary. While most of the national ones go along traditional lines, again in the spirit of subsidiarity we have trans-disciplinary activities. They are in competitive fields. Michel Carpentier, my good friend and colleague from DG XIII, says for information technology the same that I can say for materials or processing techniques or molecular biology applied to industry. It is very difficult to find good people. Our salaries—contrary to the myth of the “Brussels fat cats”—are not competitive for a bright young man who knows something about micro-electronics or molecular biology. They still come, but generally they do not stay. They stay three, four years and then they are hired away. Therefore, we do not have the problem of a frozen situation, but rather the problem that in some areas they are hard to find of the quality that we want; and though we eventually get them they tend to go away after two or three years. They get to know so much about what goes on that some firms hire them away. I say this because it is somewhat different from usual, and we have different rules. As to the total cost for management and personnel in a programme—this is specified when the programme is adopted—it cannot be more than 4.5 per cent. I think that is a reasonable quota. With that, my Lord Chairman, I think I should stop the presentation and apologise if I have not been too systematic.

Chairman] Not at all, Professor Fasella, it has been very helpful. In your paper perhaps you will be able to give us some evidence as to the successes that have stemmed from this policy because some of the criticism of your new proposals is that they are vague so that it is difficult to appreciate what it is you are after. It would be nice to be able to see some of the successes of the system.

Lord Rodney

15. You talked about the technical people you have. Can you clarify one thing: the Commission does not do research itself; it puts things out to companies who put in contracts, does it not? Therefore, your technical people—I do not want to be rude—are in a *fonctionnaire* position? They obviously have got to know what they are talking about, but they are really administrating, are they not?

A. Yes, but they have three very important tasks. Let us look at the three phases of a programme. The first is that they must look for, collect, analyse and then translate into a document the areas in which it seems worthwhile to propose a programme. Since we have to be very selective one does not necessarily need people who can do that alone but they must be knowledgeable about choosing the referees to whom they go. One needs a person who understands micro-electronics if one wants to interact with the people who run JESSI and to choose the areas in which to propose an action. The second point is that in preparing the call for proposals and in receiving the proposals and processing them, again through peers and potential users, one must understand what it is all about or one cannot even choose the peers. As an analogy, the American system of the National Science Foundation also employs people who come from research, industrial, university or institutes. For some time they work in the national research council alongside the permanent staff. For that time generally they have to stop doing their own research. Even to select the referees one must have some knowledge of what goes on and a broad understanding. The third level is that in the projects that are approved milestones are written in. If the people who go and check that the milestones are really achieved are susceptible to having the wool pulled over their eyes, there will merely be a bureaucratic evaluation of the milestones, which is not what we want. This is important because in the implementation of the new framework programme—there are some good examples—we are trying to have what in our jargon we call decentralised management. This means that the setting up of the overall programmes is done centrally, the committees to which Member States send official representatives having plenty of authority, but we think the projects could be better run by scientists, industrialists or users themselves in fairly large groups. We encourage people to submit these proposals in groups. I will give you an example of what has happened. A group of mathematicians from Cambridge invited me in July—they knew this was being done—and said, “Regarding what you want to do in the stimulation programme”—that is basic training in science through science—“we could submit fairly large proposals to form a network in which the main node would be in Cambridge but would probably include the Collèges de France, institutes of the Max Planck Gesellschaft and the Scuola Normale di Pisa”. They then said they would select a certain number of postgraduate students per year and over the period of two to three years each one would circulate in the network. They went on to say, “You would have only a single contract with us. The contract would specify what we would do,

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but then we would run it." This is decentralised management. There are other examples: the universities of the high Rhine—Strasbourg, Mulhouse, Basel, which is an honorary Community city, Freiburg and Karlsruhe—are considering submitting two projects. One is for what they call molecular engineering, which is headed by the winner of last year's Nobel prize, and the other in some agro-industrial applications. Again each would be covered by a single contract. We do not need many people to do that; they do it through decentralised management. There are many other examples, including, as you would expect, quite a few from this country. What is interesting is that for areas that are far removed from industrial competitiveness, everyone is happy with this system. Then there are the areas that are still pre-competitive but in the time dimension you could say they are three or four years from the market and in money terms you must spend at least twice as much when the Community stops paying. It is very difficult to define pre-competitive research. I give you these criteria for what they are worth. For projects which are three to four years from the market, or less if things go quickly, the companies, especially the small ones, say: do not decentralise too much because we like to have a head in Brussels who is responsible and can be chopped if there is a loss of confidentiality.

Chairman

16. Professor Fasella, since research is long term why has the Commission decided to go for a new framework policy instead of revising the old one? Would it not have been easier to get political acceptance if it appeared to be a revision as opposed to a new programme?

A. I must confess that whether it is a revision or a new programme is above me provided that we reconcile two needs, which are sometimes diverging: continuity and flexibility. On the one hand we need some long term planning because some of the activities would not be worthwhile beginning unless one knows that one can work on them for, let us say, four or five years. In particular the companies who have to pay as much as we pay—they have to give the other half—want to know for how long they can count on our half. Therefore, we need some continuity. On the other hand, things go so fast that, together with the Member States and the professional evaluators, we generally evaluate a programme twice. We do it once halfway: if it is a five-year programme, during the third year we see how far we have gone. We do this through independent groups who have had nothing to do with the programme and who sign the report on their own. The reports are made public. If a responsible scientist, technologist or manager signs a report saying, "This programme is doing fine" and it is not the case, in a way he risks his reputation. These reports as I said are public. We have found five years programme duration is necessary for the sake of continuity, but that is a little too long if one were not able to change anything. We therefore think it is advisable to have a mid-term evaluation by independent people and then one can re-orient the programmes. If after three

years it has proved not to be a very good idea, one can tone it down; and, in the meantime, new things may emerge. We have tried to propose a system that combines flexibility and continuity. The expression "rolling programme" is one that I do not like. This is because, English not being my tongue, I connect "rolling" with a "steam roller" or something that advances inexorably. However, that is just my personal feeling. Let us see what it is operationally.¹

17. How did you allocate the funds between the various programmes within the framework and why have you apparently reduced the amount that is available for research into energy? Is it an arbitrary view of the Commission as to how the sums are allocated?

A. On energy there are perhaps two points to be made. First, while the resources for energy have clearly declined in percentages, if we take what will be the actual expected budgets for the period 1987–91, the energy total was 30.9 per cent. With the new framework programme proposal, the total for energy would be 17.2 per cent for 1990–94.

18. That is a big drop?

A. Yes, as a percentage. The beginning of the present framework programme was 1987. The yearly budgets have increased: in 1988 it was more than in 1987, in 1989 more than in 1988 and the current Framework Programme proposal envisages a plateau between 1991 and 1992. The total funds available for research for the period of the new framework programme will be greater than those for the previous framework programme. In absolute terms all that was expected to be committed in energy research was 1.735 billion for the period 1987–91, and this will go up to 1.865 for the new five-year period if the proposal is accepted. This difference, which is about 6 per cent, is the expected conservative estimate of inflation for the period. In absolute terms, therefore, it is the same. In relative terms it is less because other activities like life sciences and technologies and environment have increased. That said, we have made a choice, for which the Commission is responsible, having made the proposal, but it was not done in the dark. What were the selection criteria? If one takes non-nuclear power, many results from the previous activities of research have matured and are being transferred to a programme that is no longer research; it is support for energy development and is called THERMIE. It went through Parliament last week; it is not yet final, but I think it should be adopted soon. This process is normal. If research has been successful in some

¹Note by witness:

For a five-year Framework Programme 1990–94, the natural spending profile would increase up to the end of 1992 and then decrease in 1993 and 1994. Whilst spending indications for the two final years may be less precise, it is important to provide these so that the budgetary authorities may make provision for future proposals for research. For this purpose, the proposed 1992 budget has been taken as a baseline for future years, even though the next Framework Programme (to be proposed in 1992) may require different financial commitments. This procedure allows for the flexibility to change, curtail or increase activities after three years whilst providing a five-year planning horizon for those activities which require continuity.

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areas, one transfers the results to development and stops doing the research, or the research is done by someone else. In research on non-nuclear energy, therefore, many things have been dropped and there is more concentration on the longer term issues like photovoltaics, energy saving and better use of energy. This is more concentrated. More details will be found than are given in the present programme in a new Annex 2, which describes what is proposed. The last edition was prepared in collaboration with CREST, a body on which all Member States are represented by their ministerial experts. Following the remarks that the previous version was too vague, the new version is less vague. Every delegation contributed, but the United Kingdom delegation contributed with rather clearly spelt out objectives for each of the lines and sublines. In the technical annex therefore you will find more details than were in the original proposal by the Commission. In energy one can see how the selection has been made. In the nuclear field, we think that the companies active in nuclear energy are very advanced and master the new inventions, but the Community should pursue its activities which are related to the specific responsibility it has in nuclear safety and waste management. The aim now is not fast breeders but, post Chernobyl, safety assessment, residual lifetime assessment in plants and so on and programmes in radioactive waste disposal including a comparison of three methods for long-term disposal in clays, salt mines and granites. The objective is to find the cheapest.

19. I can understand that development will increase, Professor Fasella; that is the purpose of doing research in the first instance. You spoke of energy. Does this apply to the other framework programmes or is it still more in the field of research?

A. The energy programme started long before the others; it started with the energy crisis long before there was a framework programme so it is natural that, having been the first to start, it is the first that reaches the developmental stage beyond research. For some of the applications the need to have development programmes, as the Commission found necessary for energy, is handled by DG XVII. It is post research. In other areas like information technology the pace is such that the transfer from the research phase to the industrial development stage is shorter. Industries generally do it alone or in the Eureka framework. The Commission may then intervene and pay for the more upstream part so that there is a continuum. As you know, JESSI is a Eureka project in microelectronics, a very large one, essentially proposed by industries and the Commission is studying ways of participating in the upstream part. As projects approach the market the Commission will phase out and companies will eventually pay 100 per cent.

Earl of Lauderdale

20. I have two questions. You say the fast reactor has now left the research phase and has gone into a development phase with the companies that might advance it.

A. There is a fast breeder programme that is not a

Community programme but involves five¹ countries only. In France there is an experimental reactor connected to the network. There were some problems with leaks in the sodium coolant. We do not sponsor that. It would also be very expensive and is something that I think companies could do better than we could. We are concerned with safety aspects.

21. Given the fact that the energy proportion is down and in any case the whole programme is up, or largely up, can we know the rough percentages given to the different areas?

A. I have some histograms that I could include in the paper. These I will leave with you. One could say roughly that information technology and telecommunications stays about the same, about 39 per cent combined. In the case of the industrial technologies—design manufacturing and new materials that proceed in parallel (sometimes one has to devise a new material to apply to a new robotic process or *vice versa*)—this also stays at around the same level: 15.6 per cent. What increases substantially is environment. For a number of reasons—I refer to Chapter 7 of the Single Act—the Community has increased responsibilities in the field of the environment. Analysis of the situation shows that the number of areas that need a continental approach is greatly increasing. One of the first collaborations that the Polish, Hungarian and now Soviet Governments have asked for is “Can we be associated with your research programmes in environment, monitoring and clean technologies?”. Environment, therefore, is given a more important role. In the framework programme it will be found as one component of each specific programme, but also as a programme on its own. Why is this? I may refer to the discussion that has taken place in the European Parliament and in some national parliaments where a kind of confrontation was made between Community research for competitiveness and Community research for quality of life—that is, as if the two things were in opposition—I think that this approach is wrong. Apart from fundamental humanitarian and ethical considerations, if one is not competitive in industry and one does not produce enough wealth, there will be no resources to take care of the environment, whatever people may say. On the other hand, if you develop new ventures—forgetting the environment, the quality of life and public acceptance—you are in for trouble. First, you risk not receiving money for the research; then, you may lose money if you have a new project and it fails because you did not stress the environment enough and public opinion closes it down. If—worse—you proceed with it, build something and you have not invested sufficiently in environmental protection, you risk being sued and paying through the nose. In general, restoring is much more expensive than preventing.

Lord Butterworth

22. Does this mean that your terms of reference are not drawn tightly to include the scientific only

¹Note by witness:

Originally five, now four.

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[Continued]

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but are drawn more broadly to include social and economic problems connected with the environment?

A. Yes, there is a specific sub-programme which aims at that as much as from the technical point of view. One important aspect is to assess the indirect cost—this is particularly clear in the case of energy production—of environmental damage. We had such a study carried out for Germany by the Institute für Umweltforschung in Karlsruhe. It is published but we do not circulate it too much because even though it was a very courageous attempt I think some of the assumptions made are not fully supported. It was the best that could be done, but it had limitations. However, it is published with a note explaining the limitations. We think that this should be continued. Let me give one typical example of the result of an economic study that is now important in our relations with the eastern European countries. If one wanted to reduce acid rain on southern Germany it would be much more expensive to effect abatement in noxious gas production from stations in Germany from about 45–55 per cent than it would be to go, for instance, from zero abatement to 25 per cent in Poland, Czechoslovakia and the German Democratic Republic. The first 20 per cent abatement is reasonably cheap, but the more one wishes to abate the more expensive it is. Let us imagine the map of Europe. The winds blow from your country towards southern Scandinavia and then go down to Poland, the DDR, Czechoslovakia, the Carpathians, the Alps and on to southern Germany, cross the Rhine, touch Alsace Lorraine, a little of Luxembourg and Belgium and then back into Germany. This is of course an over-simplification. You know—your Scandinavian friends at times have discussed this with you—that there is some contribution from the United Kingdom, which is being taken care of. When air goes through eastern Europe it picks up a lot of dirty gases because abatement is only minimal there. Therefore, if we help the eastern Europeans to take care of their environment that will be not entirely unselfish because it will help ours as well.

23. This surely is an excellent example of your observing the principles of subsidiarity, is it not? Here is a situation in which the result is being worked but over several countries, none of which could do it itself?

A. Absolutely, yes. We have then environmental aspects in almost all the programmes where the objective is to have clean products and clean procedures. When a new procedure is designed one requires the project to include the best possible use of raw materials so that there are few wastes. This is also sometimes better business. This can be found in all the programmes. Then there is one programme specifically for environment which has a subchapter for socio-economic problems and one for fundamental studies, including what should be the European participation in the global change programme, something that is very dear to my heart. As Chairman of the International Union of Biological Sciences I contributed to it; it must be a world programme. Europe could take its continent's share and be a partner of the others. That is the second of

the lines of the environment programme. The third, which is important for business also, is promoting science and technology for monitoring and abatement and restoration programmes. This is an increasing market. Again we are anticipating it. If the global change programme is implemented, the number of sophisticated monitoring sensors that will have to be placed throughout the world—in Europe, possibly in Africa and on the Atlantic Ocean—is enormous; it will be a great market. We must therefore provide the science and technology for it so that our firms will have the basic knowledge as the market opens up. The fourth is taking some areas—probably one programme on one or two rivers, one programme on the North Sea, one programme on the Mediterranean—and integrating all the knowledge necessary to monitor what is happening and to stop deterioration. In short, environmental considerations are everywhere in the Framework Programme and there is one specific line which embraces socio-economic, fundamental research, monitoring and abatement and what we could call regional area programmes. Moreover, it is present in all the industrial programmes in terms of clean products and clean processes.

Chairman

24. In a programme of that size involving so many different countries, there must be a large number of companies or universities involved in the work. What is your system of assessing the quality of work as to whether it is justified to continue the work? How is that done? Do you have an independent board that audits the work?

A. It is done in two ways. One is through the management itself. When the programme is launched a committee, on which representatives of the Member States sit with the Commission, writes down the call for proposals.

25. Are these Ministers, civil servants or scientists?

A. They are appointed by government and each government has its own philosophy. In most cases they can send as many as three persons per committee so generally one would find a scientist, a civil servant and the third may be an applied scientist, although it varies. Some countries send more managers and administrators; others send more technologists. They give the terms of reference for the calls for proposals. Then the calls for proposals go out, and they are fairly detailed; one then receives the resulting projects. The projects are sent to referees who are selected from a fairly long list in conjunction with governments. They are specialised referees. We generally choose several for each project. If the project is large enough to justify it, we have some referees who are experts in particular fields and we have some *generalistes* who see how the project fits in a broader frame and we generally have one person who is a potential user. If one has a project on urban pollution, then one would like to have somebody who is responsible for environment in a big urban community. They make written reports. On the basis of those written reports a selection is made. That goes to the advisory or management committee,

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which assists the Commission in selecting those that seem the best. Then the selected projects are implemented. Each project contains milestones that are verified by visits, written material and so on.

26. How rigorous is that?

A. Pretty much so, my Lord Chairman. In difficult areas it might lead, for instance, to interruption of the project after two years because results are too far off. Halfway through the programme there is the independent evaluation which is made by people who have nothing to do with the programme. They generally include an evaluator, a user and experts in the field. They have access to all the documents, they can go to see the results in the field, speak to the firms and so on and make mid-term reports. A second evaluation takes place when the programme is finished, generally two and a half years later.

Lord Sherfield

27. What you have said is very interesting. I have before me a result of the evaluation of the Esprit programme. There one has a review board and a most elaborate procedure. Is that similar to procedures adopted for other programmes or is it a rather special case?

A. We generally try to match the importance of the evaluation with the importance of the programme. In the present framework programme some programmes are very small and some, like Esprit, very large. I do not think it would make sense to have such an elaborate system for a programme of £10 million, but it is needed for a programme of £1.5 billion.

28. But the principles are the same?

A. The principles are the same. A key point is that the report is signed. The men and women who participate are rather distinguished. Some come from the outside when we do not have enough experts. We go to EFTA countries, to America, to Japan, wherever there is suitable expertise. The report is widely circulated. Even the evaluation itself is evaluated by peers because it becomes public. Let me give an example. You will have read the excellent report of the five wise men—Sir Geoffrey Allen, Eduardo Arantes e Oliveira, Hubert Markl, President of the Deutsche Forschungsgemeinschaft, Umberto Colombo and Pierre Aigrain—who reviewed the whole framework programme. In one comment they wrote—and I was surprised, because there were two chemists among them—that catalysis and membrane work should be dropped. It was their privilege to indicate that, but since the report of the five wise men was public, people who were interested read it. I received a very angry letter from the European Communities Chemistry Committee (which has among its members Fellows of the Royal Society and their likes), who said (and of course they take it out on the Commission!), "How could you say that catalysis and membranes were not important and then speak of the environment and clean waters? How can you do it without membranes?". This is an example of how in an evaluation report 70 pages long there were two words—well, I would not have

written them, I cannot say more. This is picked up by the system.

Chairman

29. You have an evaluation report that says, yes, it should be dropped, but who makes the executive decision that it should be dropped?

A. The Commission makes the decision to propose it or not.

30. Who to, the Council of Ministers?

A. Yes, and then the Council can adopt or reject or modify the proposal of the Commission. The evaluation panel says, drop catalysis and membranes; a number of chemists and chemical industries write saying, by all means keep it, and then the Commission (and this is public) can decide whether to keep it or not, but the proposal of the Commission goes to Council and Parliament, and they can and generally do modify it.

31. That is okay in a sense if you are pulling out of research in that particular area. However, if in the evaluation it is decided that company B and university C have really fallen down and are not worthy of any further support, who would that be decided by—the Commission, who would find a new set of researchers? That would not go to the Council of Ministers?

A. I think we must distinguish between programme evaluation, which looks at the whole programme, and project monitoring.

32. I think that is really what Lord Sherfield was after, the project monitoring?

A. Project monitoring works this way. The project contains set milestones. Milestones are controlled by the officials of the Commission—if they feel they do not know enough they can ask experts—and by the special management committee on which experts of the Member States sit. If it is found that a project—say with companies and a university—is falling behind and getting bad results or, when you visit, you find they are not doing what they said, then you apply the contract. The contract is written in such a way that you stop the contract if some conditions are not being fulfilled. If they fall behind for reasons that can be understood—and research has a strong element of uncertainty—you do not stop the contract. If, however, they have fallen behind because they have not worked hard enough or they are unable to proceed, the contract can be stopped. For the second half of the programme you then have more money and can make a new call for proposals.

Baroness Llewelyn-Davies of Hastoe

33. In our papers we have read criticism about evaluation. As you describe the process as you carry it out, it sounds very thorough. Is this a new development on your part or has it been going for some years?

A. It is good, but I think it could still be improved and we are working hard on improving it. We started doing it in the early 1980s. The first evaluations were rather superficial. We have occasionally asked people to study the evaluation system overall and

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give us advice. A study was done three years ago by Robert Chabbal, who used to be responsible for research in NATO and then worked for the French Government in a Ministry and is now director of research in OECD. He made an interesting report on evaluation. In the meantime we have studied evaluation by consulting Member States and, for example, the US. The Swedes have a good system. We learn also from the usefulness of previous reports. I do not think the system is perfect, but it is much better than it was. There is still a lot that can be done. There are problems with evaluation. I must say here that the United Kingdom Government has been very helpful and seconded Dr Lewison of the Department of Trade and Industry, who participates in the team and has been a very useful addition to it. Sometimes the terms of reference of the programmes have not been clear, and in the beginning did not exist at all. The definition of the terms of reference is better now because we now have some experience with evaluation, having learnt from the mistakes. We did make quite a few but now we are not making so many. The first point then is to have good terms of reference in the programme itself. Then it is sometimes difficult to find the right people for evaluation. For large programmes almost everyone in Europe who is engaged in a particular area is already in the programme. For instance, for nuclear fusion we had to have recourse to America and the Japanese because practically all the European fusion experts are participating and thus would be judging themselves. Moreover, from Europe we also ask the nuclear fissionists or the non-nuclear energy experts, who are of course the rivals of the fusion people, to participate, or maybe some economists. For fusion itself we have to go to America or Japan because all the Europeans are part of the system. Sometimes, therefore, you have trouble finding people and at others you have trouble because the kind of people you want are too busy. We often find that top men and women who have just retired are particularly good—the sort of person who has been very active until January and all of a sudden has free time. They cannot be used in that capacity for too long, but for the first four years or so they are very good. No, it is not perfect at all, and I am sorry if I gave that impression. We are still making a lot of mistakes that come out, and we have a lot of work to do on this.

Earl of Lauderdale

34. May I come back to the general picture. In regard to the programme we gather that about 17 per cent goes on energy, 16 per cent on industrial and materials techniques and 39 per cent on information and communications. Are we to take it that roughly 30 per cent, the remaining balance, is on the environment?

A. No. I will give you the histograms which have the old and the new programmes so that you can see it graphically. An important part is for industrial enabling technologies. That is over 50 per cent.

35. That is what is called management of intellectual resources?

A. No, my Lord Chairman, that is another one,

going up to 9 per cent. We have 39 per cent for telecommunications and information technology in the new programme, 15.6 per cent for industrial technology, 13 per cent for life sciences and technologies. There is 14.3 per cent for energy, 9 per cent for environment and 9 per cent for what used to be stimulation and now is basic research and advanced training through research, which is perhaps the most difficult to explain politically although I think it has been one of the most useful actions. Previously, around 4 per cent of funds were allocated to this area, and this has become 9 per cent. It is not completely tied down *a priori* by what even the best brains can predict so as to leave something for new ideas. If new ideas could be predicted, they would not be new. To have a system that is open to new ideas, provided there is a good system of referees, is desirable. It has been possible to build up a good system of referees because the scientists themselves have been very co-operative. The Royal Society has suggested numbers of its people as have Max Planck and others, and we have them all together. If you ever came, you would see we have pretty good information on this. We have about 3,000 referees; suggestions from one country are generally checked by their peers in other countries. When a proposal arrives, we send it to the referees—three or four, depending on the size of the project. The reports of the referees come in and are studied. Then the proposals and reports are submitted to a committee of knowledgeable people. The British members, for example, are Peter Swinnerton-Dyer, David Phillips, and, now, Sir Charles Reece, who used to be head of research for ICI. They jointly look again at the referees' report and make the final selection. This has led to a number of interesting projects based on non-predictable ideas. There is a project that came, as it were, bottom up from neurobiologists, solid state physicists and "informaticists", and it is called Brain.¹ The mathematicians write down an algorithm, that is, a formula, describing how some parts of the brain work, following research by neurobiologists. The solid state physicists then try to produce non-biological devices capable of responding to stimuli according to a pattern which can be described by the same mathematical formula. This is very exciting. In another field people have been building a very thin layer of polymers with a system of conjugated double bonds through which electric charges can be transferred easily. They then dope them with heavy metals and put them in a magnetic field across the system of double bonds. The resulting system has most unusual electro-magnetic properties which could not be foreseen. Each of these projects involves groups of researchers from four or five different nations. The rule of thumb here is again subsidiarity. If one takes whatever can be done by two laboratories—let us say an English laboratory and a German laboratory—they should come not to us but to the Royal Society, Max Planck, SERC or DFG. When there are three or more, however, then it is worth coming through to us because it is less complicated. If a poor scientist has to go

¹Basic Research in Adaptive Intelligence and Neurobiology.

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[Earl of Lauderdale *Contd*]

through five bilateral agreements, he will lose all interest in the project. If he goes through a single body that allows the five groups to work together it is easier. This again is subsidiarity. That is why much of the money must remain with the simple national systems. We must come in when there are projects (and there are quite a few) in which more than two should participate.

Lord Rodney

36. Perhaps I may come back to something slightly more basic. As I understand it, the things you support are pre-competitive?

A. Yes.

37. They involve research and development? I can understand how research can be pre-competitive or non-competitive, but when one gets into development I find it more difficult to understand how you can stay in the pre-competitive area. Secondly, if I as a company am involved in a project and it progresses to the pre-market and I think, "This is a good project, I should like to take it on", just because I have been paying 50 per cent of the thing can I just take it or do I then have to have a licence and pay fees? How does it get into industry?

A. This is all clearly spelt out by the contract. It took about two and a half years to develop a contract which almost everybody liked—I say almost because we still receive criticisms. The Court of Auditors requested that we have a single contract. That was difficult to do. Therefore, we now have a contract that has several options for the key articles. Proponents can choose. We know all options are acceptable. Each proponent can choose from the various options and make his own version of the contract but without having to renegotiate it because all the options have been spelt out. In practice, one of the main difficulties was with the assessment of previous knowledge that the different partners bring when that knowledge is not already protected by patent. I may say to the noble Lord, Lord Rodney, "I have extremely interesting results which are very valuable"; and the noble Lord will say, "I have results which are even more valuable". If they are not published nor covered by a patent there is a tug of war—secrecy agreements about which some people feel badly and so on. A particular difficulty we had was with the pre-existing knowledge and how to evaluate it. As to the implementation so far, the present contracts spell out the rights of each participant and give relatively fewer problems. We will have increasing problems with patents in respect of biotechnology. Here the European legislation is way behind that of the Americans.

Lord Renwick

38. This again is a rather basic question. Can you explain what proportion is projects brought to you by the Member States or member countries or universities within Member States, and what proportion you have to initiate, and how do you expect that to change with the new framework programme? Do the various countries that contribute to the funding

get back roughly what they give and do they or their organisations participate in the same proportions?

A. They do not. I think this is inevitable. We try to establish a balance among the interests of the 12 Member States at the level of the choice of programme. For instance, the United Kingdom rather likes the information technology programme and is not very interested in raw materials or solar energy. Other countries, however, are interested in solar energy and raw materials; and, especially if they are not very advanced technically, they want collaboration with the Member States that could provide them with the technology. This is one of the difficulties when the framework programme is adopted, that is, to have a programme where the areas of interest of all 12 Member States are recognised even though they do not coincide. The Portuguese may accept nuclear fusion even though they are not very interested and Germany accepted solar energy even though she was not very interested. We try to establish a consensus at the level of the framework programme. When each specific programme is launched, then we are very rigorous in spite of the pressures that sometimes occur, particularly at the beginning. The principle is to select on the basis of what seem to be the best projects. Inevitably some countries have a larger number of excellent projects than others. Since the selection is based on quality, the distribution is not according to *juste retour*. Some countries have more, others less. It is a problem through which I have personally lived in Italy: Lombardy has low unemployment, a large growth rate and in some programmes gets as much as 80 per cent of Community funding to Italy because it is able to use this funding better. If one accepts lower scientific standards for less-developed regions, one does a disservice to those regions, which will be condemned to being second best always. One encourages them to invest the little money and relatively few educated people they have in second rate projects. One must, therefore, force them to move upwards, but that is not always easy. The framework programme by itself can help only partially but in combination with the regional policy funds more can be achieved. The structural policies include a programme called STRIDE, which provides for developing scientific infrastructures. We have an example that we always quote—though unfortunately there are not too many. In Greece we combined with the Greek Government, and I think we helped in the decision, to use some of the structural funds for creating a scientific infrastructure. They did not try to do everything; rather they took one area of micro-electronics and one area of biotechnology which were relevant to industries and Mediterranean agriculture. I believe they shortened a motor route by five miles and with the money from those five miles they built two good laboratories with lots of equipment and no marble. Most important, they looked for people. They got some excellent people. One of them, for instance, is Professor Kafatos, who is a Fellow of the National Academy of Science of the United States and a professor at Harvard. If you go to Greece his lab is worthwhile visiting. It is a good

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[Lord Renwick *Contd*]

laboratory and you may find several of your compatriots, who find it interesting to work there. They have the leadership in a common programme in which also participate Ashburner from Cambridge and Jaekle from Germany on the genome analysis of *Drosophila*. Unhappily there are not many such good cases that I can quote. The key I think was to find the right man, that is, first, the man, then the money and the rest follows.

Lord Sherfield

39. The British Government recently have laid a great deal of emphasis here on the difference between strategic and near market research. You have the words "non-competitive", and "pre-competitive" research. What is the difference between these two concepts and does the position of the British Government on near market research create difficulties in the Commission?

A. Concerning national support for industrial research with public funds, the Commission has to make sure that the rules on fair competition in the Treaty of Rome are respected. The Commission may intervene applying the competition rules, in particular Article 92, if governments mask aids with the face of research. The Commission has to verify that governments do not violate competition rules by giving aid—and I fear that my compatriots sometimes have been accused of that, labelling as research something which becomes very like a subsidy—well, we are very much against it. To define "pre-competitive" is very difficult. It is different for various areas of technology. I quoted earlier today two criteria which I think I have largely borrowed from Pierre Aigrin, a former research Minister, now connected with research in Thomson: he prefers the term *pré-concurrentiel* to indicate that it must stop short of the market. However, this is rather vague. If one wants to be a little less vague I personally see at least two criteria, one based on money, the other based on time. I think that public support should stop when

one is three years or more away from the market and when in terms of investment one will have to invest for the final development at least as much as one has invested up to that moment. If we could find better definitions we would like to have them, because, like evaluation, it is a difficult problem. Indeed, it may become more difficult if GATT gets into this matter.

40. Certainly near market research is also very difficult to define. I wonder whether there is simply a general difficulty in defining "pre-competitive", "near market" and so on and whether this is creating an extra difficulty in the work of the Commission?

A. It does and we certainly have to be careful to stop before we get too near the market. One activity that I think is important is to strengthen "pre-normative" research—I do not know whether that word exists in the English language?

41. I think not.

A. By that we mean research that gives scientific knowledge and technological knowhow on which to base norms. This is needed. It is connected with the internal market. It has to be done at community level—and very soon possibly at EFTA level: it is useful to industry, but is not a subsidy.

Chairman] Professor Fasella, I must thank you on behalf of the Committee. You have done very well. You have been on now for one and three quarter hours. You have been very helpful and have given us a great deal of information which I have a feeling we shall need to follow up with you. This I think we can do, as we agreed earlier, by a paper¹. We will go through what you have said today and if we may we should like to send you a few other questions that come to our mind. You have done very well. We are most grateful to you.

¹Professor Fasella subsequently submitted copies of the Commission's booklet "EC Research Funding—A Guide for Applicants" (January 1990).

THURSDAY 7 DECEMBER 1989

Present:

Chilston, V.
 Ezra, L.
 Gorell, L.
 Hanworth, V.
 Lauderdale, E.
 Lloyd of Kilgerran, L.
 Lockwood, B.

Lucas of Chilworth, L.
 Portland, D.
 Renwick, L.
 Serota, B.
 Shepherd, L. (Chairman)
 Sherfield, L.
 Stedman, L.

Examination of witnesses

The Hon DOUGLAS HOGG, a Member of the House of Commons, Minister for Trade and Enterprise examined; Mr ROBERT FOSTER, Department of Trade and Industry, Mr P L THOMAS and Mr P J COLYER, Cabinet Office, called in and examined.

Chairman

42. Minister, welcome to this Committee and I should like to say how pleased we are that you agreed to come and answer questions. With regard to procedure, it is not our normal practice to go into private session but we do have that facility available to us. If at any stage any of the questions you would prefer to answer privately, then, of course, that can be so arranged if the Committee wish to pursue the question, although it is not our normal practice to do it that way. The other matter is that if at any stage you would like to call on any of your colleagues, you are most free to do so.

(*Mr Hogg*) I imagine that I shall be doing that. This is a technical field and, whilst I have a fairly good grip of the constitutional aspects of the matter, when we come down to some of the programme "lines" I cannot pretend I am as fully in charge of it as I should be, so I shall be looking to my colleagues.

43. Minister, my colleagues are, of course, very well aware of the high quality of research and development that is taking place in the United Kingdom and, for that matter, in other countries within the Community. Many of us, however, feel that, to meet the potential incursions and threats from Japan and the United States in trade with the Community, there are some fields of research and development where it may be necessary and desirable that the Community, with all its resources, which obviously are much greater than any individual country, should be brought together to match the capabilities of Japan and the United States. So the first question I would like to put to you is this: does the Government believe that the Commission has a role in the field of research and development? If that is the case, how do you see the Commission performing that responsibility and are there any areas of concern in the past where there may have been failings or successes?

(*Mr Hogg*) I fancy that you are drawing a distinction in your own mind between the Commission

and the concept of the programme. I think they are slightly distinct.

44. Yes.

(*Mr Hogg*) Can I deal with the role of the Commission first and then go into the concept of the programme. So far as the Commission is concerned, you will appreciate that what they are doing through the Council and the Council working with the Commission is to set out the strategic programme for the period covered in the Framework Programme, which runs for a term of five years. The actual detail of the subsequent research is dealt with by way of specific programmes which are proposed by the Commission and are subject to qualified voting thereafter. So the role of the Commission and the Council is potentially strategic. The fleshing-out will go down several tiers and will be as the result of much discussion at official and other levels. On the question of the programme, whether it is valuable for what it seeks to achieve, the answer is that I do attach a high value to it, yes, and I think that can be seen in a number of ways, of which I would mention just these. Firstly, there are a number of issues that cross national interests which are so broad in their character that they require the pooling of resources and are essentially international in scope. I would mention, for example, the work that is proposed on the environment. I think also that there are programmes which require resources which are in excess of those which any one particular country can produce. The energy programme is an example of that. I think that there are also programmes—and this really goes back to the point you were making about the Japanese and the Americans—where they were in the business of actually establishing a resources and manufacturing capacity which could meet the challenge of the Japanese. For example, we need equal standards so that European manufacturers can, in fact, be gearing their work to common standards in the production of what they are seeking to produce in order to compete. So that is another area where there is a justification for the pooling of

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resources. I am also very strongly impressed by the advantages of the co-operation generally. I think it is a jolly good thing for British companies, not to mention institutes of higher education, to become involved in a collaborative sense with their counterparts in Europe and, therefore, bringing all these things together, I think there is a very considerable argument, which I share, in favour of the Community Framework Programme, past and present.

45. But what would be the Government's view of the past programmes in which the Commission has been involved? Are you satisfied that we, shall we say, as a Community have had value for money from it? Is their machinery such that they can provide the quality check on research?

(Mr Hogg) If you are talking about the evaluation, I think the answer to that would be on the whole yes. There are areas of criticism in the review assessment and the ability to change programmes. It is a bit difficult, it seems to me at the moment, or has been in the past, to draw lessons from the evaluations that have been going on with a view to changing the on-going programmes, in particular changing from one specific area of research to another specific area of research. I think it has been a bit too set in the past. That is one of the points in the assessment by the "Five Wise Men", but I would not want to criticise the overall quality of the programmes. I think they have been rather good, as a matter of fact, but I think maybe the evaluation of what has gone on and the monitoring has not been as good as we would have liked to see it and as we hope to incorporate it in the future programmes.

46. The evidence we had last week was, as you say, an admission that perhaps in the past evaluation has not been as good as it should have been but they have made decided improvements in recent years. Would you agree with that?

(Mr Hogg) Broadly, yes. One of the problems is to know the extent to which the proposed new framework actually takes account of the recommendations made by the Five Wise Men in their report. Mr Pandolfi says—and I am sure he is doing his best in this regard—he is trying to incorporate the lessons of the revision into the forthcoming Framework Programme. It is a bit difficult for us to determine the extent to which that has been done. We are also very supportive of his view that management consultants should be set up, empowered to look into the monitoring systems whereby they control programmes, and we are hoping to see the terms of reference so that we can see exactly what the management consultants are going to be addressing.

47. The Council of Ministers have approved the projects, as I understand it. Do you seek satisfaction from the Commission that they are doing that? Is that the role of the Council of Ministers?

(Mr Hogg) I am going to need a bit of advice on this. The Council of Ministers, of course, approved the Framework Programme and the Technical Annex. I am not sure—and I shall take advice on this—whether the specific programmes come before the Council as such for detailed scrutiny.

(Mr Thomas) Yes, that is the case, that once a strategic Framework Programme is agreed which sets down the general directing lines of research for the next five-year period, the Commission will come forward with a set of specific proposals under each of the headings. We do not yet know how many headings there will be under the new Framework Programme but something in the order of ten to fifteen, and those are then considered individually by the Council of Ministers and, as the Minister has already said, voted on by a qualified majority.

Earl of Lauderdale

48. The Council of Ministers for each country who are concerned with research?

(Mr Hogg) That is correct, yes.

(Mr Thomas) The management of these individual programmes, however, is part of the decision by the Council of Ministers. There is a management structure and this can be more or less rigid or involve the Member States in a greater or lesser degree, and that is very important in the way that programmes are implemented, addressed and evaluated at their end.

Chairman

49. I must say I find it rather strange that the Commission, when they came forward with their new Framework, provided no information whatsoever. Was that deliberate and, if it was deliberate, why?

(Mr Hogg) I think it is a different approach, if I may say so, as between them and ourselves, Chairman. It was deliberate in the sense that they thought it was the right approach. As a matter of fact, Vice President Pandolfi would tell you if you talked to him about it that he had gone into very considerable detail and had taken account of the recommendations made, to the effect that they ought to put more flesh on the framework proposals. There were six lines in the Technical Annex, but he would certainly tell you it was wrong in principle to go into too much detail, that being a matter for the specific programmes to be decided thereafter. Our view is, and was—and we carried a lot of support for this view in the two Council meetings I attended—that it was essential to give much greater detail in terms of priorities, strategic objectives and weighting within each of the headings which he has set out. In fact, we have achieved that, or very largely achieved it. The Technical Annex which is now before us—and I am grateful to officials who played such a prominent part in negotiating it—is infinitely better than that which first emerged. That is not to say we do not have reservations; we do, but it is a much better document and one with which we are a great deal more comfortable.

50. Could you give a reason why the Commission decided to produce a new programme as opposed to continuing with the old and updating it, because research and development is a long-term concept, is it not?

(Mr Hogg) It is, Lord Shepherd, yes. I think you

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are really identifying here whether at the review period we should have just, as it were, dealt with the period to the end of the existing Framework Programme, which is 1991, or whether they should have gone into a rolling programme. That is the distinction. The advantages of a rolling programme are, as they would be expressed by most members of the Council, that they do give you greater continuity of planning in terms of research and development, and whilst it is true that we have not yet committed ourselves to a firm view that we would expect to see a rolling programme rolling forward (if I can use that clumsy expression) from 1992 onwards, I think it is very probable that the Council will conclude in 1992, when we will be carrying out our next assessment, that there are considerable attractions in such an approach to the conduct of Framework Programmes.

51. It will be very similar to the system adopted in this country through the Research Councils, where it is a rolling programme and the knife is put in from time to time to remove dead wood and bring in new?

(Mr Hogg) Exactly. The latter point you made is extremely important, in the sense that the mid-term review which has just been taking place with this Framework Programme and will take place with the third Framework Programme should, indeed, take account of the need to excise as well as the need to add. But you are quite right, a rolling programme envisages carrying the work forward after you have reviewed the quality of the work which by then has already been done.

52. And for that purpose, of course, you would need qualified individuals?

(Mr Hogg) That is correct. Of course, the Five Wise Men sought to address that question. As you know, there is an evaluation unit (I forget its full title) within the Commission, but my understanding is that it is not sufficiently high in the hierarchy to perform precisely the view you have been identifying and is more of a co-ordinating arm to get other people to do that.

53. Would that be dealt with for the future?

(Mr Hogg) I am afraid I cannot answer that question specifically.

(Mr Foster) Yes, we have pressed DGXII very strongly to strengthen their evaluation unit in particular. It is not just in terms of the numbers but in terms of the criteria they use for the evaluation of longer-term programmes. We believe, for example, that in the United Kingdom we probably have as much experience as any country, if not more on the whole, of developing criteria for evaluation and we have agreed with Professor Fasella to exchange information. Indeed, one of the Department of Trade and Industry staff is now working for Professor Fasella and there is a very good interchange of information on the development of these criteria. But we are pressing the Commission very hard to take more fully on board the approach we have on "testable" objectives in evaluating programmes.

54. Is there any difficulty from the Commission's

point of view? Does it create a precedence that might be awkward in other areas for the Commission?

(Mr Foster) No, it is highly welcome. Certainly Professor Fasella is delighted that there is a good UK man helping on this link to take full advantage of the criteria which have been developed in the United Kingdom.

Lord Renwick

55. I think Mr Foster has just answered the question I was going to ask but I would perhaps like to continue a little more about the evaluation. I think we must all agree that to spend this amount of money, the better it is managed and the better the research is managed and the way in which the results of such research are disseminated is extremely important, but it can take too big a priority and possibly become too top-heavy in administration, when the money really should be applied to the research. So I am sure there is a balancing act?

(Mr Hogg) That is correct.

56. I wondered if we might ask the Minister to give us a little detail.

(Mr Hogg) To be honest, I am slightly reluctant to do so because it is still the subject of negotiation. We have not got an approved Technical Annex yet. We are still negotiating within CREST, which is the group of experts, as to the content of the Technical Annex. As a matter of fact, I actually do not see particularly why you should not have a copy now but it would be on the basis that it is private to yourselves. Mr Thomas is going to tell me you cannot have it.

(Mr Thomas) Not at all, Minister. In the original proposal from the Commission dated 3 August, I think, there was an Annex 2, which set out their idea of the technical contents over the next five years. That, as the Minister has already described, has undergone extensive revision, so it is the latest draft we will be able to offer you.

Baroness Serota

57. Could we perhaps, Lord Chairman, have the Technical Annex with a further explanatory memorandum?

(Mr Hogg) While I think it is desirable that this Committee should have the Technical Annex, I would be grateful if you would bear in mind that it is only the stage that it has currently reached.

58. We appreciate that.

(Mr Hogg) We are in the business of negotiating on it yet further, so please do not treat it as the final document because it is not the final document; it is just the place where it is now.

Earl of Lauderdale

59. When is it likely to be complete?

(Mr Hogg) The Technical Annex?

60. Yes.

(Mr Hogg) The meeting of the Council is Friday week, 15 December. We are hoping the Technical Annex will be completed by the beginning of the week.

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[Continued

Chairman

61. Perhaps then we might have it when it has been completed?

(*Mr Hogg*) If that would suit you, but I would equally, if it would help you, be prepared to allow you to have the present draft as soon as we can get copies over to your Committee, whatever suits you.

62. I would suggest once it has been completed.

(*Mr Hogg*) If your Lordship would be content with that, I would be happy to let you have that.

Viscount Hanworth

63. Who has caused the revision to be made?

(*Mr Hogg*) Lots of us. I am glad to say we were very successful in persuading other countries of the need to tackle the Technical Annex, because, as I think Lord Shepherd said, the original Technical Annex was very sparse in terms of detail and was frankly quite inadequate and this was a view shared by all delegations to the Council and, therefore, all the delegations played an important part in redrafting it. The French, of course, have the Presidency and they played a prominent part in the actual drafting of it, but I am glad to say UK officials have been extremely influential in the shaping of the Technical Annex.

Baroness Lockwood

64. I would like to follow up the point you made, Minister, about having a new programme rather than revising the existing programme. Some of the evidence which we have received, in particular from industry, seems to feel that in a way this is almost a continuation of and complementary to the work that has already been done. Would you agree with that?

(*Mr Hogg*) I would agree. It is an expansion and a building on the contents of the previous Technical Annexes, so in broad terms one could also quantify it if one set one's mind to it. I agree with what you have said.

65. Therefore it is almost a rolling programme?

(*Mr Hogg*) It is a rolling programme because we have agreed it is a rolling programme as of now, but what I was actually referring to earlier was whether we would agree to a rolling programme from the expiration or from the halfway point of the forthcoming Framework Programme. We are not yet committed to that but if you ask me do I see attractions in agreeing to that, the answer is yes, but that is not the issue here.

66. Given the long-term nature of research, that would seem very desirable, would it not?

(*Mr Hogg*) The trouble with it, if I may say so, is that once you have committed yourself to the concept of a rolling programme you are always in danger of a step increase in expenditure beyond that which you really want to do and you have to be jolly sure you set up in the Framework Programme an adequate mechanism for excising as well as adding—this was Lord Shepherd's point—and we want to be

sure of those points and guard ourselves against step changes before we have committed ourselves to a rolling programme from 1991 onwards.

Lord Lloyd of Kilgerran

67. May I mention to the Minister that yesterday the Prime Minister, in a splendid speech she gave at the 50th anniversary of the Parliamentary Scientific Committee, emphasised the importance, in relation to research and development, in relation to industry as well as the academics, of patent law.

(*Mr Hogg*) I am not surprised you should tell me so!

68. May I say your father once did a patent case—

(*Mr Hogg*) Probably led by you, actually!

69. No, no. In an informal talk about it at the reception given by the Duke of Edinburgh afterwards she said intellectual property was a matter of great importance. When you look at the document that I have upon the R&D, it has in paragraph 3, "Management of Intellectual Resources".

(*Mr Hogg*) I am not sure what you have on this.

70. I have a document headed, "Annex B, Working Paper concerning the Proposals for the Framework Programme." I do not think it is very much and I want to have it exact. Page 3 of the Contents, paragraph 3, refers to, "Management of Intellectual Resources", and you would expect me to say when I see the words "intellectual resources" it would include intellectual property.

(*Mr Hogg*) I am not surprised you should say that.

71. Thank you very much indeed. I would, therefore, be very surprised if, in the new document you are preparing, you do not emphasise, as the Prime Minister has emphasised, the importance of intellectual property.

(*Mr Hogg*) You do put your arguments in the most persuasive form! That is no doubt why you earned so much money when you were in practice!

Lord Ezra

72. Could I go back to the Minister's preliminary remarks in which he said among other reasons for supporting this whole concept were the advantages of collaborative research. Clearly that is something which commands the support of a lot of the Members of this Committee, but could I ask how the changes of emphasis and priority on collaborative research are introduced in the Framework? Is this done when the Framework is reviewed or are there opportunities during the course of particular programmes to say, "Now this has happened and, therefore, we ought to be devoting more effort in this particular field"?

(*Mr Hogg*) The principal answer to your question is, at the mid-term review, but clearly there is a capacity in line management to do some modification prior to the mid-term review. But the broad, prime answer to your question is, at the mid-term review.

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Viscount Hanworth

73. How is the research work parcelled out?

(Mr Hogg) In terms of quantum I understand that in some areas of research we have in the order of about 30 per cent. of the whole. As you know, we contribute rather under 20 per cent. of the spend; 18.9 per cent. is the figure in my mind.

(Mr Thomas) It is 18.7 per cent..

74. And going further down, who decides? Do you decide how—

(Mr Hogg) No, the lead contractor.

75. Do you decide which contractor to use?

(Mr Hogg) The lead contractor is responsible for the subcontract work.

Earl of Lauderdale

76. You said "we". Does that mean the United Kingdom?

(Mr Hogg) "We" in what context?

77. You just said, "We do this, that and the other"?

(Mr Hogg) So far as the spend is concerned, 18.7 per cent. is our spend. On the question of the contract, the lead contractor apportions the subcontract work.

Chairman

78. So we get more out of it than we put in?

(Mr Hogg) That is correct.

79. Is there any question of additionality? Do you cut funds in a field of UK research because those organisations may have received funds from the Commission?

(Mr Hogg) Can I just clarify it. Mr Thomas was saying, quite rightly, that whilst in some contracts we have had as high as 30 per cent. of the whole, 23 per cent. is probably the average figure. That is against a financial contribution of 18.7 per cent., so we get more out of it than we put in. But it would not be right to say we get the difference between 30 per cent. and 18.7 per cent.. We get the difference between 23 per cent. and 18.7 per cent.. On the question you asked regarding additionality, there are, if I may say so, two points. One is the Euro-PES rules and the other is the concept of additionality. So far as Euro-PES is concerned, I do not know whether you have seen the explanation. I think it may be set out in a supplementary memorandum.

(Mr Thomas) Yes, it is.

(Mr Hogg) We will also give you a copy of a letter we have written to Mr Tam Dalyell¹, which sets out the detail of the Euro-PES rules, which do result, in certain circumstances, in a reduction of domestic expenditure when there has been an increase in spending by UK departments on R&D through the Framework. So there is the potential for cut there unless the programme is reinstated in subsequent public expenditure statements. That is different

from the other question you raised, which is additionality, and broadly speaking, we will try, when agreeing the Framework Programme and when agreeing the specific programmes thereafter, to ensure that the work is genuinely additional; in other words, I regret to tell you, subsidiarity, which means much the same thing.

Viscount Hanworth

80. As a small follow-on, the research work we are getting presumably is under several of the main headings?

(Mr Hogg) That is correct. There are six lines at the moment and I will ask officials but I suspect we are getting work under all six lines.

81. I wanted to be sure that they were not passing out one heading to one nation. It is a bit of probably most of them?

(Mr Hogg) I hope so. The answer is yes.

Viscount Hanworth] That is all I wanted to know.

Baroness Serota

82. Following Lord Hanworth's point, you have just pre-empted me on additionality but on this point about the areas, I wondered if the Minister could tell us whether the Government is satisfied with the areas as defined?

(Mr Hogg) Yes, broadly.

83. And whether you think the balance of funding as between them is correct?

(Mr Hogg) The answer to that is broadly yes. There are reservations about the Technical Annex which go both to balance and to content, but the broad answer is yes. However, I think I would also have to say that, so far as line 1 is concerned, which is the informational technology line, we think the telematic programme is a bit of a problem. We think so far as line 2 is concerned, which is industrial and material technologies, this is an area which could be trimmed quite substantially. We think so far as line 4 is concerned, which is life sciences, there are too many lines at the moment and too many things, as it were, are subsumed within the overall head, which is going to make for some considerable difficulties in management, and we think so far as line 6 is concerned, which is human mobility, that the justification for all the work there set out is a bit thin, so if I were to summarise our point, there are just too many, but that is in summary form.

84. And the allocation of funding as between the areas?

(Mr Hogg) That is more difficult to determine because that does take us to overall budgeting, but, as I say, so far as line 2 is concerned, we do expect to see a significant cut so far as industrial and material technology is concerned. We think also that there are some economies to be made within the information technology head, which is line 1. May I ask my officials if there are any other points because it is an important point.

(Mr Thomas) I think there has not been that much

¹This is not printed, but its contents are repeated *verbatim* in the Departments paper printed on p 80 below.

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negotiation on the relative balance between the lines but, as the Minister has said, broadly we are content. It will depend on the overall budget figure which is set and whether there would then be disproportionate reductions in certain lines.

85. That was the supplementary I was about to ask. I take it the issues that the Minister has just highlighted are the matters you are in negotiation about at the moment?

(*Mr Hogg*) You need to draw a distinction, though they do obviously overlap, between the context of the Technical Annex and ultimately what we are going to do about the budget. These things inevitably overlap but we are talking, so far as the Technical Annex is concerned, about a better balancing under the various heads.

Lord Lloyd of Kilgerran

86. May I follow Lady Serota's question. I was a little surprised that in the line you referred to about communication technology you did not emphasise more that what this document from the EEC emphasises is information security. In this House as well as in the other place there has been tremendous evidence from industry to say there are great losses arising from lack of security, and all the viruses and hackers.

(*Mr Hogg*) We are aware of that.

87. I hope you will be producing a Bill fairly soon.

(*Mr Hogg*) There are two questions. So far as the lines are concerned, I will ask Mr Foster to respond. So far as the Bill is concerned, you know it was not announced in the Queen's Speech.

88. I am well aware of that.

(*Mr Hogg*) You also know that the Law Commission have made these proposals which the Government is very supportive of and if we could find a nice, kind backbencher to take a Bill through this Parliament this session—I was actually thinking in our House but your House is a splendid place to introduce a Bill.

89. To declare an interest, I am still the Hon. Secretary of the Parliamentary Information Technology Committee and in view of the Minister's kind words about my income, I do this for nothing!

(*Mr Hogg*) I never regarded you as a charity before!

Lord Lloyd of Kilgerran] I should also declare an interest in that I do know it was not mentioned in the Queen's Speech but the CBI pushed me along in order to make a presentation here during the course of the Queen's Speech and I was able to help with a Bill.

Chairman

90. Before we get down to the question of pay

(*Mr Hogg*) My Lord, I think Mr Robert Foster might answer Lord Lloyd's point on the question of security.

(*Mr Foster*) There is now, in fact, in the communication sub-line a reference to security. A programme has been defined of which the research aspect will be concerned with the definition of international standards and certification. One is talking about a very sensitive area, inevitably, but the right discussions have occurred with the relevant security authorities.

Lord Lloyd of Kilgerran] I hope they are speaking the same language. If so, may I presume to congratulate you for taking so much notice of this important question.

Lord Lucas of Chilworth

91. Could I ask two questions, please? The first relates to something you said in your earlier remarks when you talked about the changes which were negotiated by officials being infinitely better. I take it there has been a subsequent conversation you have had with the Committee that illustrates this betterment? My second question is quite different because I would like to return to the question of additionality. I was not totally clear exactly what you meant when you described it as too prominent. If industry, with perhaps academic institutions, secure monies from the Government through the Research Councils for undertaking a certain piece of work, and there is perhaps a commitment for two-year or three-year funding, that work may then be undertaken in the Community in one of the lines at some time in appraisal, so that money—which is UK money as well as other money—is then devoted to it, are the monies which I referred to in the first part of the remark then cut? Is that what you meant by a cut in terms of what I have always felt, which is that additionality is not truly additionality because it is already counted before the grants are made, therefore, one could end up by starting and then stopping full stop, because somebody else is going to do the work?

(*Mr Hogg*) My Lord, you have asked two questions, and perhaps I might deal with them separately. So far as the first question is concerned, you asked me the nature of the betterment as between the technical annex in the first drafting of it and the technical annex in its present form. The answer to that question is that the technical annex in its present form has been transformed in terms of strategic objectives now stated where previously they were not, much greater explanation of what is precisely proposed, a description in broad terms of research contemplated. In other words, it has been fleshed out in a number of very important respects, though falling short of the kind of detail that will have to be set out in the specific programme subsequently to be agreed.

(*Mr Foster*) If I could flesh that out fractionally, in particular the emphasis in the objectives is very clearly on not just the pre-competitive research but on the pre-competitive research which is for the pre-normative work underpinning research on standards in particularly, for example, inter-operability of networks or in the information technology area.

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Demonstrators, for example, which are part of the programme will be purely to demonstrate the use of standards. There will be no funding that is explicitly for product development.

(*Mr Hogg*) That actually is not so much fleshing out as a departure from one of the things that seems to me to have been implied. That is an important departure, and I am glad that Robert Foster raised it. It is not just fleshing out, it is actually a change, because they were getting rather close to the market in their concepts in the first technical annex, and Robert is quite right about it, we and others have managed to pull them back from that concept. I notice that Philip is passing me notes, which suggests to me that my answer may in part have been wrong in the first place, in which case he can jolly well qualify it when I have finished! On the question of additionality, there are two points to be taken into account. One is the application of the PES laws, and the other is that what we are seeking to do through the European framework is to do those things that are better done at a European level and not those things which are currently in hand within national programmes. As to additionality, it is actually called "subsidiarity", but between us we have been using the word "additionality". I am party to the fault as well, but "subsidiarity" is the word that actually is used. Therefore, we should really talk in terms of subsidiarity by which we do mean elements in the programme which are best dealt with at a European level, and that implies not being currently done within existing national programmes. On the question of Europe PES funding, the principle—which will be, indeed *is*, set out in the letter which I will put before you, if I may, and which is in the supplementary memorandum not the main memorandum—is broadly that resources that are being allocated by way of increased spending on the R & D framework programme are deductible from domestic spending managed by individual departments and therefore they can be taken away from the individual departments' spending lines for their own domestic research. Against that, of course, it is also possible, and indeed inevitable, that the departments would apply for a reinstatement of specific programmes when they come to bid to the Treasury for the new lines of spending. Taking your specific question "Could a programme be cut as a consequence?", whilst in theory the answer is probably yes, I think in practice that it is something that would not happen. I am not aware of any examples of its having happened—the officials will tell me if I am wrong on this point—and I think it is a theoretical rather than a real fear.

92. So to protect against that, of course, there has to be a very close liaison between officials managing our end of the official framework and those managing the domestic end?

(*Mr Hogg*) Yes, Lord Lucas. That is why we have addressed so much time and effort to the formulation of the technical annex and why too officials will play such a prominent role in the drawing up, or be involved in the drawing up, of specific programmes, because we *do* want to prevent a sure subsidiarity.

Viscount Chilston

93. Minister, Lady Serota asked about the balance of funding. There are some areas in which Europe is deemed to be a leader—for example, in information technology—and I think that that is one area where the intention is possibly to cut the amount of funding given to information technology. Is it the intention that Europe is funded for doing research into areas which it is already at the top of, or is it alternatively that one gives funding to the areas in which Europe is probably lagging behind—for example, manufacturing technologies?

(*Mr Hogg*) My Lord, much as I would like to agree with the premise, I have to say that I cannot, because we do not lead the rest of the world. We are not at the top of the tree in information technology or telecommunications. We are quite well placed in telecommunications, but not in information technology. I am afraid—I hate to face it, but it is true—that the Japanese are substantially ahead of us. There are elements within line one, which is the information technology head, where we think that cuts can be made—for example, in the telematic sub-line—but overall we are not in the business of cutting back substantially on information technology. Quite the reverse. We do attach a very high importance to common standards set in that field, because we do want to take a quantum leap, if we can, over the present level of technology now held by the Japanese. We are *not* in the business, Lord Chilston, simply of catching them all up, because they will all go scampering ahead like hares. We are attempting by this process to try to get a quantum leap to the next stage.

94. In other words, are you saying that we want to fund those areas where Europe has a good chance to be at the top, rather than keeping all levels roughly up to scratch?

(*Mr Hogg*) Not universally, because of course it is only those areas covered by the lines which have been set out. However, in information technology the answer is yes. Robert is burning to make a point!

(*Mr Foster*) I think that part of the answer to that, Lord Chilston, is that the real objective is to try to increase user competitiveness. One is not trying just to strengthen the suppliers, but one is trying overall to encourage user competitiveness. The best way to do that is in the whole development of standards and the inter-operability of information technology systems, wherever those may be supplied from. Clearly one hopes that the UK and Europe will take a major chunk of that supply, but there will be supplies from all over the world. What is important is that users have access to the very best techniques and are able, particularly with the development of networking, to have a fast access to the systems of other users.

Chairman

95. Could I follow that point in regard to Japan. It seems to me that the great success of Japan has been not only their ability in the field of research but also their ability to acquire research knowledge from

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other parts of the country, but their greatest strength has been the way in which they have been able to develop it. Would you agree?

(Mr Hogg) Yes.

96. So do we in the Commission, or do we within this country, have the balance right between research as such and, once having acquired the knowledge, how do we exploit it, how do we develop it into a product that can be sold or used?

(Mr Hogg) My Lord Chairman, you are clearly focussing on an issue which is of very general application, but within the specific area within the framework programme, we are seeking, in some areas, to do that to which you referred. That is partly through the EUREKA programme. The JESSI programme, you might remember, is semi-conductors. That is a rather good example of trying to bring it forward to the stage where we are almost developing programmes for the JESSI programme. I do not know if your Lordships are particularly well briefed on JESSI, but it is an important area of research involving a number of different governments—this begins to show my scientific ignorance (I expect no laughter!)—in the business of developing semi-conductors, which I understand to be a scientific term! I am looking at my officials and saying, "Come on!"

97. Does the Commission in its framework set aside a quantum of money for development?

(Mr Foster) Could I say, my Lord Chairman, that I think in past framework programmes there perhaps has been too great an emphasis just on the research aspect. One of the points made by the External Review Board to which the Minister referred—the committee of wise men—is that there should be a greater emphasis on technology transfer in this programme, hence one of the points the UK has been making quite clear is that we would want to see an element of whatever it is, 20 percent or whatever, overall, and the way that that is being planned to be done. We have been very careful in its technical annex to limit that technology transfer in particular to the use, for example, of demonstrators which show the use of standards without getting into the actual design stage. But we see that as very important. So there is a very limited base of research, very substantial pre-competitive strategic research, but a very defined chunk of technology transfer.

98. Could I take it, then, that at the moment you would not be quite satisfied with the balance?

(Mr Hogg) Under the existing programmes, that would be correct.

Lord Ezra

99. Could I probe this a bit further, because it is very important. Does it mean, then, in certain areas that once the basic research is done, the feeling is that there should be a move in those cases to what one might call demonstration plants?

(Mr Hogg) Yes.

100. And that from that the various parties could then derive their further development and then get to the commercial stage? Is that how it would work?

(Mr Hogg) That is a correct statement, my Lord.

(Mr Foster) But only a limited number of demonstrations.

101. In that case, it then raises two more questions. First of all, these of course can be fairly costly, can they not?

(Mr Hogg) Yes.

102. A demonstration plant, as I know from my energy experience, can be a very costly experience, can it not?

(Mr Hogg) Yes.

103. So that could absorb quite a high proportion of resources. Secondly, what is important is where that demonstration plant would be located. How is that agreed? Do people take turns, or is it a question of where the basic research is done?

(Mr Hogg) My Lord, I cannot answer that question, because the formulation of sites and the awarding of contracts will follow the agreement on the specific programmes. An agreement in the first instance will be made as regards the identity of the head contractor, and the head contractor will then decide as to where the subcontract work will be done.

(Mr Foster) If I may take a practical example, Lord Ezra, if, for example, in the area of telecommunications there will be advance communications experiments, and the purpose of those is that when you have a European standard which is based on the international standard you have actually to decide within Europe what are the sub-standards within that which are relevant, a pilot has to be run. Part of the purpose of the pilot is to demonstrate whether the CCITT standards and sub-options will work. You then feed the information back from that into the European standards-making machinery. So we hope, for example, in that area that the pilots would be an integral part of the European standards-making machinery. Where they would be sited would almost certainly be in the lead countries. That would include no doubt the UK, Germany, Italy and France.

Baroness Lockwood

104. It was really on this whole question of the balance between research and development that I was wanting to ask my question. We have now dealt very satisfactorily, I would think, with the applied and the development of research, but how basic is the research? How basic are some of the research contracts? Is it absolutely specified as to what is required, or is there scope for developments perhaps into completely new areas?

(Mr Hogg) I think I am going to allow the officials to answer that question, Lady Lockwood, because I have a nasty feeling that I shall be getting out of my depth! The framework programme states the main projects, the aspirations and objectives. The specific programmes go into greater detail. The actual implementation of that detail will be for the institutions of higher education concerned and/or the companies. However, I think the officials may want to add to that.

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(*Mr Thomas*) It clearly depends which area of R & D activity you are looking at. You have already discussed a little about the information technology and communications lines, which are not so much basic as a little further along the spectrum. However, if you take an area like life sciences, for example, there will be work on human genome analysis, molecular biology, which is much more towards the basic end of the spectrum, though aiming ultimately to have a follow-through in an industrial and therefore in a competitive sense. The same would be true in agro-industrial areas or marine sciences. You are looking at fairly basic issues but which you hope will have a developmental impact.

105. So within the European framework there will be scope for developing some of the new aspects of science on which we have been very good in the past in this country, and which of course is very fundamental to later developments and to our competitive position?

(*Mr Thomas*) Biotechnology would be a very good example of those new sorts of fields where the UK has a considerable lead in some areas.

(*Mr Foster*) Although I think I should add that in the industrial areas, which are over half the programme, the focus will *not* be in basic research, it will be very definitely on strategic research, with a strong management committee in which the UK will play a major part in order to help to direct those programmes.

Lord Gorell

106. I am very much on a learning curve in this type of operation. It seems to me that when the proposal for the framework programme was put forward, that was really just a starting gun of somebody saying, "It's time we looked at this whole thing again," they put down a whole list of objectives, and we started to look at that. But that really is only a starting gun. The real nitty-gritty is all coming out in the technical annex, plus the budgeting, and until you see that and look at that, you cannot really form any kind of judgements as to the value or the worthwhileness and so forth of the framework programme. Would you agree with that?

(*Mr Hogg*) My Lord, I do not wholly agree with your description of the initial proposals. I am assuming that you are talking about *this* framework programme.

107. Yes, I am.

(*Mr Hogg*) I do not think that I would agree with the view that the Commission put their proposals forward as part of a process of just triggering discussion. I think that Mr Pandolfi would say that he envisaged that *his* technical annex, which we discussed in September, was a definitive technical annex, and I think he was a little aggrieved when then people said that they did not agree. But when you say that you cannot really assess the value of the programme until you have seen the concluding technical annex, you are right, with this one proviso that the specific programmes are of course critical to the implementation of the technical annex. So I

am afraid that at the moment we are still feeling our way towards the final assessment of what is to be done, which will of course affect our views on money.

Viscount Hanworth

108. Are you satisfied, in general terms, with the dissemination of information which becomes available from the research? Presumably the main contractor has to write some report which somebody circulates. How does that happen? Is it really getting where it ought to get?

(*Mr Hogg*) To say that I have no reason to doubt that, is not a very successful answer, because of course one would not necessarily have reason to doubt it. I do not think that the wise men were particularly critical on this point.

(*Mr Thomas*) That is true, but at the same time the Framework Programme looks as if it will pay considerably more attention to the dissemination of research results, which cuts across or is linked to the question of intellectual property rights, which Lord Lloyd mentioned earlier. There may be a specific programme line and therefore budgetary resources allocated to dissemination, so there is something of a central direction for it, but specific dissemination would still belong to the project managers of each particular project. A number of Member States, including the United Kingdom, are particularly concerned that the results of research should not just be circulated amongst the larger companies but should also filter down to the small and medium enterprises.

Earl of Lauderdale

109. Going back to the strategic balance between different categories, I wonder whether the Minister would comment on the reduction in percentage terms with regard to energy. In particular, can there be any further consideration given to the three aspects of energy in the near-term and investigation into new uses for and applications of natural gas, which looks like being in surplus supply in the next 20-30 years and, further along, the fast-reactor, to say nothing of the fusion reactor, JET at Culham and NET at Garching, where Britain seems to be cutting back or holding back on research in those areas?

(*Mr Hogg*) The advice I have received as far as the energy line is concerned is that it is a proper reflection of the state of supply and the balance is right. That is the advice I have hitherto received. On the particular point you have raised regarding gas and nuclear fusion, I will ask my colleagues to comment.

(*Mr Thomas*) My Lord, on the question of gas, there is no specific reference in the technical annex as it is currently drafted to gas projects. That would fall under the first line, which is non-nuclear fuels. There has been no great emphasis on that so far. On the question of fusion, an important British objective has been to avoid prejudging at this stage later decisions about whether to prolong the JET project, let alone whether there should be a next step in the fusion field. Those decisions will be taken in due course when a panel of evaluators has looked at progress to date on the JET programme.

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[Earl of Lauderdale *Contd*]

110. That would come under the umbrella of the Framework Programme?

(*Mr Thomas*) Decisions on the JET programme are taken by unanimity under the EURATOM Treaty, while the necessary funding is an integral part of the Framework Programme and therefore there is a reference to fusion in the technical annex.

111. That applies also to fast-reactor research?

(*Mr Thomas*) Rather like gas, there is no specific reference so far to fast-breeder work.

112. Do those not seem to be rather serious gaps?

(*Mr Thomas*) As the Minister said, I think there is general agreement that the percentage of funds devoted to the energy field is on a descending path.

Chairman

113. Why?

(*Mr Thomas*) In the past, energy has taken a very, very large chunk indeed; it is now down to about 12%, and that has dropped very considerably over the last five years. Why? I think that the concern about the replacement of fossil fuels peaked in the early seventies or mid-seventies, and there is sufficient work going on on the nuclear side, particularly fusion. The size of resources currently being looked at is 1.1bn ecu.

Earl of Lauderdale

114. Since from the Atlantic to the Urals—which is now being called the European home—there is every sign that a lot of gas has been found and more will be found, at a time when we are bothered about high-cost energy and availability there is a lot of lower-cost energy this is surely an important factor which could make a big difference to industrial policy in Western Europe, and yet this has not come into the Programme at this stage?

(*Mr Hogg*) It is an interesting point. The trouble is that it presupposes the ability to deliver, which really lies outside—

115. Pipelines already criss-cross Europe?

(*Mr Hogg*) It depends on the ability to deliver, and that means the ability and willingness of the Eastern bloc countries to do that in the context of their own requirements. I am not sure it is essentially a matter for the Framework Programme. It is a very important question, and I am not trying to underestimate its importance, but I am not clear in my own mind that it is a matter which should be addressed in an R&D programme. I suspect it is a free-standing issue; that is my immediate reaction, though it is an interesting point on which I had not previously focused.

Lord Ezra

116. What concerns us in our other capacity in looking at energy subjects is the environmental aspects and energy efficiency aspects. I would like to ask whether those two aspects of energy come into the programme at all?

(*Mr Thomas*) In the first part of line 5 dealing with

the non-nuclear area there is not only a reference to renewables but also to the more efficient use of existing resources and less environmentally damaging uses of it, so both parts of the question are answered in the programme.

Lord Sherfield

117. To put a general question, is the Minister reasonably satisfied with the progress of the negotiations in the context of the next ministerial meeting?

(*Mr Hogg*) My Lord, there are a number of points involved. First of all, may I say we would like to reach an agreement. We do not want to see a repetition of what happened last time, if we can conceivably avoid it. I am pleased by the way the discussions on the technical annex have gone. We have reservations about it, but it is a much better document than it was before. I am also pleased by the acceptance of a number of important points that we have made in the course of our negotiations, most particularly that there needs to be a unanimous decision as far as the post-1992 spend is concerned, that is, 1993-94. We have not yet agreed money. As you will appreciate, as far as the period 1990-92 is concerned, we are considering two elements of money. If I may call those two elements A and B for convenience, A is the balance of the existing Framework Programme, and as I recall it that is 3.1 becu. B is what element should now be introduced over and above the 3.1. The ceiling under the inter-institutional agreement is 2.7 becu. Our view is that that figure is too high and we would not want to accept any figure of that kind, partly because we do not think it should go to the ceiling and partly because we do not think the content of the technical work being proposed justifies a spend of 2.7 becu. I told Mr Pandolfi that on Monday; he has that message. Whether we can carry other countries with us on that point is not clear, so for the period 1990-92 there has not been any movement in terms of money as yet. As far as the period 1993-94 is concerned, again there are two elements of money. I make the point that it is subject to unanimous voting. The first element is the indicative figure we will have to put in under the existing Framework Programme. I told Mr Pandolfi that we were hoping to keep a broad similarity as far as 1993 and 1994 were concerned with the two previous years. That is still a matter for discussion. There is another element of money, which is the state of the rolling programme coming forward. That will not be decided until 1992. We have not agreed the figures. I do not know whether we will agree them; I hope we can, but even if we cannot I am pleased with the way the negotiations have gone. Most of our cardinal points have been accepted and the Framework Programme is infinitely better and more acceptable to us than ever it was. That is a rolling answer to a rolling question.

118. As far as the programme itself is concerned, you are pretty well satisfied, and as far as the money is concerned it is all to play for, or partly to play for?

(*Mr Hogg*) As far as the programme is concerned, we are much better satisfied than we were.

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[Continued]

[Lord Sherfield *Contd*]

We have reservations on the broad shape of the programme, but it is much more acceptable. As far as money is concerned, we have not as yet arrived at a collective view ourselves, and that is a collective process. We could not accept 7.7 becu, and Mr Pandolfi knows that; I told Mr Pandolfi that when I saw him on Monday. A proposal for 6 becu would be far too high as well. We have discussed the matter in some detail, and I have no doubt that as a former minister of finance he can work out what we have in mind, because I gave him the building bricks.

Chairman

119. How far in the UK and Community are you governed by the availability of excellence? When I was Chairman of the Medical Research Council there were certain parts of the research fund allocated to specific projects of research into this and that. It was felt vitally necessary to have certain funds available to encourage young scientists to come forward with new ideas, maybe not in a very formative way, but where there was clear potential, perhaps being based on the character and excellence of the individual or individuals involved. Is there room for that in the Community's programme?

(Mr Hogg) Yes. I would like to make sure I am answering the right question. Is there in the programme a facility for bringing forward new skills not yet fully developed? The answer to that question is yes. The other question which I thought you might be asking is: Is there already in place a sufficient degree of excellence to address some of the goals of the Framework Programme?

120. I put that at the beginning.

(Mr Hogg) The answer to that question is also yes. We do not feel uncomfortable about either question; both can be answered affirmatively.

121. Is the relationship between the academic world and industry a good one?

(Mr Hogg) Yes, and also domestically through the LINK programmes.

122. Because there is difficulty where industry

tends to keep the information as tight as it can for commercial reasons, whereas a young scientist makes his future by his ability to write reports and have them circulated throughout the academic world?

(Mr Hogg) I am sure that is right. It sounds sensible to me, but I have no personal experience of it, that the more collaborative you become on specific objectives both through our own LINK programmes and European programmes the more you break down the barriers, subject to one over-arching proviso—the word “over-arching” was used by the former Chancellor and has become part of the jargon of this place—that when dealing with strategic non-near-market research the ability to disseminate information is much greater than when it is dealing with near-market research. That is one of the important reasons why, as Lord Lloyd told you, we must be careful to avoid near-market research as part of collaborative programmes because of its impact on intellectual property.

123. For once, the questions have dried up, and I find it rather unusual. We have had a very helpful and interesting morning. I do not know whether there is any concluding remark you would like to make to the Committee?

(Mr Hogg) Only this, that we want to play a full part in the process. I know there were anxieties about the way events developed in the last negotiations. We have tried throughout the negotiations to be wholly constructive. I think we have succeeded as a matter of fact, and if we can come to a reasonable decision on money we will be very pleased. We would like to see an agreement reached at the end of this month. The Council meeting is on December 15. I shall be taking my sleeping bag with me. In the end, the matter depends on the overall figures; it is a numbers game as much as anything else.

Chairman] Minister, thank you very much for your attendance and for the information you have given, and may I also thank your colleagues who have supported you today.

THURSDAY 25 JANUARY 1990

Present:

Chilston, V.	Lockwood, B.
Gregson, L.	Lucas of Chilworth, L.
Hanworth, V.	Portland, D.
Lauderdale, E.	Renwick L.
Llewelyn-Davies of Hastoe, B.	Rodney, L.
Lloyd of Kilgerran, L.	Sherfield, L.

In the absence of the Chairman, Lord Renwick took the Chair.

Memorandum by Dr Gordon Adam, Member of the European Parliament for Northumbria, Vice-Chairman, Energy, Research and Technology Committee of the European Parliament

Q1 How far is the European Programme for R&D desirable at all? Which are the areas where collaboration between the Community and Member States will be most beneficial?

Are the six areas identified for Commission support the rights ones?

The European Community Framework Programme is an important weapon in strengthening the competitive position of Community industries in relation to the Internal Market and world markets. It supplements the research and development carried out in each country in three particular respects. Firstly, by carrying out programmes which are too expensive for any one country to finance on its own. The best example of this is the fusion programme (JET). Secondly, by promoting collaborative research in key sectors such as information technology (ESPRIT) and telecommunications (RACE). Thirdly, by stimulating contact between and amongst scientists and technologists from universities and industry across the whole Community.

Current evidence suggests the Framework Programme is most successful in developing European standards which will be of crucial value to the Internal Market, indeed, make it possible. Industrial/university collaboration has also been a fruitful area, but does have a limitation from the point of view that there is a tendency to draw the universities into shorter programmes.

The three strategic areas set down by the Commission, diffusion technologies, management of natural resources and management of intellectual resources, have not been seriously challenged during discussions in the Energy, Research and Technology Committee, nor at any of the other meetings in which I have been involved during the consultation procedure. The allocation of the main activities, however, is not always logical in my view. I prefer the term "enabling" instead of "diffusion" for the first area, and would add a third activity "biotechnology and chemicals", drawing this from the Commission's section on life sciences. I would re-schedule the activities as follows:

Enabling Technologies

1. Information and Communications Technologies.
2. Industrial and Materials Technologies.
3. Biotechnology and Chemicals.

Management of Natural Resources

4. Quality of Life (to include environment, health, toxicity, social and economic aspects).
5. Energy.
6. Agricultural Technology.

Development of Intellectual Resources

7. Human Scientific and Technological Capital and Mobility.

Q2. What value is such a vague Framework Programme as proposed, which gives almost no detail on the scope of particular projects to be covered?

The Framework Programme as presented by the Commission is a very unsatisfactory document, particularly Annex II. It does not contain a statement of objectives and lacks a coherent strategy. Fewer budget lines should not mean increased vagueness.

There is no discussion of the reasons for the selection of Community activities as opposed to national

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[Continued]

or global (wider than Community) agreements. The co-ordination with national programmes is not demonstrated. The contribution of the Joint Research Centre is not elaborated. It does not show how the current Framework Programme has produced an improvement of the competitiveness of Community industries, or in what ways their share of world markets has increased.

It is clear that Annex II will have to be substantially amended before this proposed Third Framework Programme is approved.

Q3. Is the Commission right to propose a new Programme, rather than revising the existing Programme?

Since all the existing research action programmes will continue, it is difficult to see the precise difference between a new Programme and a revision, however the finance available under the current budgetary agreements (2.6 billion ecu) has to be incorporated informally into the Programme in accordance with the terms of the Single European Act. The Commission has also taken the opportunity to propose a tighter structure and reduce the number of research action programmes which currently number 37. The question is now somewhat academic, since consideration is so far advanced that it would be administratively inconvenient to call for a revision instead of the new Programme proposed.

Q4. Has the Commission adequately justified the resources to be made available?

The short answer to this question is "No!".

The total amount indicated of 7.7 billion ecu merely continues beyond 1992 the amounts shown as available under the financial perspectives (Category 3) of the Inter-Institutional Agreement, with a very small increase in the total level of Framework Programme expenditure reached in 1992 relating to both Framework Programme II and the proposed Framework Programme III. This is shown in paragraph 2 of the financial statement.

As the Energy, Research and Technology Committee's budget spokesman since 1981, I can testify that the number of Category A projects submitted for each action programme always exceeds the funds available. Rarely is the factor less than two and can be five or even higher. The Commission does not explain why it does not call for a much larger figure to reflect these requests.

Q5. Is the balance of funding between areas correct? In particular, is the Commission right to reduce support for projects concerned with energy?

This is a difficult question to answer, not being an expert in all the fields of activity proposed. However, I feel that there is probably too much for microelectronics and not sufficient for chemicals and pharmaceuticals. This arises from too great an emphasis on trying to leap-frog Japan and the United States in the areas where they are dominant, and not enough effort to develop new industrial areas and maintain existing leads.

Q6. Does the long-term nature of R&D mean that the Commission is correct to set out funding over the four year life of the projects now? Should decisions about financing after 1992 be taken when it is clearer what budgetary arrangements will apply then? Should a portion of the budget allocation for the Programme be set aside as a reserve to cover financing of new projects that may be deemed necessary when the Programme is revised in 1992?

The first and second Framework Programmes with multiannual funding were started before the Inter-Institutional Agreement and the financial perspectives which accompany it. The expenditure allocated each year was always decided under the budgetary provisions of the Treaties. This remains the position with the additional provision of the Single European Act, which specifies that the total amounts allocated to the research action programmes must not exceed the Framework Programme indicative ceiling.

The proposed third Framework Programme extends beyond the timescale of the Inter-Institutional Agreement, which ends in 1992. Hence the indicated amounts beyond this timescale will be subject to:

- (a) the revision of the Inter-Institutional Agreement and the financial perspectives; and
- (b) the annual budgetary procedures.

I see no problem with this and would argue that to show a smaller Programme beyond 1992 would destroy confidence in the future of the Programme.

Q7. Does the proposal give sufficient weight to the need for evaluation of projects?

An answer to this question must really wait until it is possible to assess the effectiveness of the new MONITOR Programme of evaluation.

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[Continued

Examination of witnesses

Dr GORDON ADAM, MEP, and Mr JAMES SPENCE, Secretariat, European Parliament Committee on Energy, Research and Technology, examined.

Chairman

124. We welcome you to Sub-Committee B. Dr Adam, I understand you are vice-chairman of the European Parliament Committee on Energy, Research and Technology, and Mr Spence is from the Secretariat of that committee. We welcome you both to give evidence on the subject of the framework programme. We have read your submission with interest. If there is anything that does not come out in our next hour of discussion, I hope that you will feel free to put it in writing. I understand that since you wrote the evidence certain actions have been taken by the Council of Ministers on the framework programme. Perhaps you would like to give your views on the agreement that has been reached. Could you also tell the Sub-Committee what procedures if any the European Parliament will be following to continue your scrutiny in this matter?

(Dr Adam) Thank you very much for your welcome, my Lord Chairman. It is true that there has been a Council decision since the evidence I gave earlier was submitted. The Energy, Research and Technology Committee has been very critical of the Council's decision first because we believe that the consultation process has been very poor. We worked very hard to get an opinion through the European Parliament by the middle of December in order that the Council could make a decision in 1989, but we did not expect that the pace at which we were going to work would mean that our views would not be looked at seriously. Secondly, we are not satisfied with the financial outcome of the Council's decision; we are not satisfied about the content of the proposals where very few of our ideas have been taken into account. We do not like the proposal that 15 action programmes should be dropped on our desks next month as it is an unprecedented workload for our committee to have to handle. In my view it means less consultation rather than more consultation. On top of all that we seem to be heading for a further review of the programme during 1992 so instead of having a five-year framework programme we are ending up with a three-year programme. Some of us in the past have argued that perhaps five years was not long enough. In the five wise men report¹ I think there is a reference to the possibility of having a six-year programme so the process of revision and consultation could take place in a more sensitive fashion. For all those reasons, my Lord Chairman, the committee is extremely dissatisfied. We have indicated to the Council that we wish to proceed with conciliation. That means that the formal Council decision is held up until the process is completed. That meeting has been arranged for 26 February.

The indication we have is that the Council and the Commission are taking a very rigid attitude towards the possibility of any further revision. I must add, I think, that one has to see this in relation to the generally deteriorating relationship between the European Parliament and the Commission that is taking place at present. Without some movement it would be my feeling that the process of dealing with the research action programmes calling for the use of the co-operation procedure under the Single European Act will not be as harmonious as we have been accustomed to.

125. You have raised a great many points there, Dr Adam. The first matter I should like to ask you about is your submission that the programme is due for reassessment in 1992. That surely applies only to the budgetary side, or is it the whole programme?

(Dr Adam) It is a complicated matter, but there is no firm decision.¹ The indications are there. Perhaps I ought to say a little about the budget side of it. Up to 1992 the Council have failed to allocate 200 million ecu which are available under the current financial perspectives. We believe that this is contrary to the inter-institutional agreement. Paragraph 17 of that agreement says that the amount available would be respected and it has not been. There is a reduction of 200 million ecu which we hoped we would have available up to 1992. In 1992 we will reach an annual expenditure of 2.3 billion ecu—all the figures are in units of European currency—and that means for the following two years just keeping at the same level we should have 4.6 billion ecu; all the Council is indicating is 3.2 billion ecu. At the moment we are saying that after 1992 all we can be reasonably certain of is 70 per cent of the effort that we will reach in that year. They then say that since the financial perspectives have to be revised, and that will be during the second half of 1991, there will follow from that the possible evaluation of the programme and the revision of the budget that is set down in Annex I. We cannot spend the money in the research action programmes unless the ceiling amount is indicated in Annex I. In the second half of 1991, therefore, we are facing not only a revision of the financial perspectives but also a revaluation of the framework programme followed by a possible revision of the budget provision for the framework programme. All that has got to be completed before the preliminary draft budget for 1993 is put on the table in March 1992. The workload we see in front of us is therefore quite horrendous.

Chairman] We agree with you as a Committee that the workload provided by 15 action programmes is rather awesome, but we are hoping to evolve a

¹Note by the witness:

This is the report to the Commission by Mr P Aigrain, Professor E Arantis d'Oliveira, Sir Geoffrey Allen, Professor H Markl and Professor U Colombo on the evaluation of the framework programme 1987-91, of June 1989.

¹Note by the witness:

The text of the common orientation Article 5 states that the Commission will undertake a mid-term review of the programme. I would expect this to be retained in the final decision.

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Dr GORDON ADAM, MEP and Mr JAMES SPENCE

[Continued]

[Chairman Contd]

strategy to enable us to cope with those by anticipating them!¹

Viscount Hanworth

126. May I ask who in fact is saying what should be done, and at what level?

(*Dr Adam*) This is the decision of the Council of Ministers, which was made at the Council meeting in December.

127. How did that arise, so to speak? Presumably they had papers on the subject?

(*Dr Adam*) Oh, yes, through the normal consultation procedure, which started with the Commission proposal and the Parliament opinion on it; then there were discussions that were very wide ranging among the representatives of the various governments before they came to this common orientation, as they call it.

128. What was the Parliament saying? Was it in favour or not?

(*Dr Adam*) The Parliament made considerable comment and criticism of the original proposal partly for the reasons that they were rather vague, as was indicated in the first question that your Lordships sent to us; and secondly, on the financial question. I think all the documents that relate to this process have been lodged with the Committee, and we have available, if it is of assistance to the Committee, a comparative chart of the original Commission proposals, Parliament's amendments and the Council's final decision.

Chairman] It would be very useful if we could have that, Dr Adam, thank you.

Baroness Llewelyn-Davies of Hastoe] Mr Lord Chairman, I am a little puzzled because the evidence we heard from the Cabinet Office about the Council of Ministers seemed to say rather different from what we hear from Dr Adam.

Chairman] With respect, I agree. I think we would do well to consider this and compare the evidence we are hearing now with the Cabinet Office paper.

Baroness Lockwood

129. With regard to the withholding of this funding until the 1991 financial review, can Dr Adam tell us whether it is in the view of his committee a purely financial question or do the Council of Ministers feel that there might be new projects that would fit into the overall framework emerging in that period?

(*Dr Adam*) We have established the framework programme at a particular financial level at the

moment. The demands we get for all the research action programmes are of the order of three or four times the amount of money that we have available. I am talking here about "A" grade proposals, not just the generality of proposals that come forward. We believe therefore that what we are financing is effective. The amount of money that was indicated originally in the financial perspectives agreement ought to be available to us if we need it: that is the argument. The Council are saying, "We take that as just an indication and we are going to keep you below it". Unless the figure corresponds in Annex I of the framework programme Council decision, we are not, under the Single European Act, able to commit the expenditure. That is our problem. As you know, my Lord Chairman, there is a continual battle between the Council and the Parliament over the level of expenditure.

Lord Sherfield

130. The Council agreed that it would be logical to conduct future R&D at the Community level on the basis of interlocking rolling programmes. Do I understand from what you say that you do not agree with that?

(*Dr Adam*) My view is that it is more a lurching programme than a rolling programme that we are now getting. If I may backtrack a little to an earlier comment that I made, the process of getting agreement with these programmes in the first place is a 12-month job in the main. If there is a five-year programme and there is a review or evaluation that takes place at the two and a half year period, then there is at least another 12 months after that for all this to be considered, new proposals to be brought forward and for the agreement to go into the Council. It would be very optimistic to reckon on doing that within a 12-month period. Therefore, one is getting very near to the end of the current programme before one can hope to have a revised programme in place. That is why I have always argued in favour of a six-year framework programme because in my judgment the timetables of various events fit that better. If one then pulls it back and says, "We're going to review these programmes within a five-year period", this means that before anything sensible can have happened in the research and development field one will be called upon to review it. We know that the type of programmes and events with which we are dealing are not things that will change much over the course of a 12-month period. In my judgment therefore one has to allow a reasonable amount of time for the programmes to go through and thereafter one can then have a better understanding of what further changes may be necessary—additional finance, less finance or sometimes stopping a programme altogether or bringing in something completely new. With the very short time spans we now face, the business of consultation—not only with the European Parliament but also among governments themselves, representatives of industry and the universities who are involved in all these procedures—all becomes very difficult.

¹Note by the witness:

The European Parliament Committee can also anticipate action programmes, particularly on important issues where the Committee wishes to make certain that the Commission is aware of Parliamentary opinion. However, once the action programmes are sent to the Parliament for opinion, the full procedure has to be applied and it is extremely doubtful if any of the programmes envisaged can be subject to the shortened procedures which the Parliament has available.

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Dr GORDON ADAM, MEP and Mr JAMES SPENCE

[Continued]

Chairman

131. Thank you, Dr Adam. In your submission you mention that the number of projects submitted for each action programme always exceeds the funds available, and rarely is the factor less than two and it can be five or even higher. Are you in your committee in a position to have any influence over the way the Commission handles submissions of projects? I understand that many of the technical proposals are now done on a tiered system, so that the university or industrial company making proposals for funding by the Commission does not have to put in the whole proposal, with the enormous expense involved, but does it under certain subjects and by an elimination process applications can be tiered. May we have your views on that?

(Dr Adam) As regards the selection of projects, this is in the hands of the Commission through their advisory committees. There are different systems of dealing with that. If you wished to go further into that, Mr Spence is better qualified to deal with it than I am. We are not involved in the selection of projects. When dealing with each research action programme we set down the field of activity we believe should be pursued and we give some indication as to the relative priorities that are involved. For instance, we might say that a particular type of study should be followed rather than something else. If it is a non-nuclear energy programme we may say we want more emphasis on solar power than on geothermal. That is the kind of thing. How that is acted on by the Commission is up to them: they are the people who manage it. They have to assess the projects that come in. I have always taken the view that whatever indicative amounts there may be about the percentage that should go into a particular area the overriding consideration has to be the scientific and technical excellence of the project. Once one moves away from that as a bench mark I think one is subverting the object of the exercise. We are not therefore directly involved with the selection of the projects. However, we come in on the review procedure, and we have quite a growing role there.

132. That is the evaluation procedure?

(Dr Adam) Yes.

133. In the submission you mention the Monitor programme of evaluation. Is it relevant for you to explain that to us?

(Dr Adam) Yes, my Lord Chairman. There has been a lot of criticism over the years about the way in which the various programmes have been evaluated ready for the next phase. The Commission has no general system of dealing with the review procedure. Last year we agreed with them the so-called Monitor programme, the main purpose of which is to agree an evaluation system that will apply to all the research work that is carried out by the Community, in whichever directorate. Not all the directors agree with that concept, of course, but that is the idea. Each research action programme produces a review. In many cases a small group of people are asked to look at what has happened and they produce a report. What we now try to do in parliamentary committee is at very least to invite the chairman of that panel to come and

meet us and explain how he sees it. We have also started to refer these reports to the STOA panel, that is the Scientific and Technological Options Assessment Unit, which is similar to the POST unit that you have here. The idea is that our STOA panel will look at each of the evaluation reports as well and get somebody who is competent in the field to pass an opinion about it. It will not be an elaborate evaluation, but we want to have the benefit of someone who is an expert in that field before us when we come to our evaluation. All that, of course, is taken into account when we go through the procedure for agreeing the next research action programme or the next framework programme.

Lord Lucas of Chilworth

134. Are you suggesting then, Dr Adam, that there is something wrong with the present evaluation system or indeed with the people who make an evaluation? It seems to me that the present system and the evaluators provide your committee and, indeed, the Parliament, with a summary of what has been decided. Are you suggesting that Parliament or the parliamentary committee should set up a further evaluation, calling in experts perhaps from a different source (experts, of course, seldom agree about anything) so duplicating the whole system, and for what purpose? If it is just a question of budget, then surely you accept the evaluation panel or you reject it and that is that, rather than going through another procedure, which seems to be time-consuming, expensive and unsatisfactory for those putting forward the projects, leaving doubt, misery and so on behind it?

(Dr Adam) That is one way of looking at it. I would agree that there has been an improvement in the way in which the projects have been evaluated in recent years. We now get an evaluation report on most of them. There is not however, so to speak, a Commission system; there is no methodology applied by the Commission to the process. The purpose of the Monitor programme is to try to put that into place. When it comes to the actual evaluation the parliamentary committee and the Parliament itself have no influence on who is asked to carry out the evaluation. We may have no one in the committee who is particularly competent in the field in question. Our idea therefore was that we should take advantage of our technical unit which we set up to advise us on broader issues. We are not going to get a whole new panel of people in to look at each evaluation; we will simply ask one person—a small check, if you like, on what is presented in front of us. It is no different from the way I might pass a particular report to someone, say, in a local university or polytechnic and ask their view of it, but this would be done by the parliamentary system. That is all we are proposing to do at this stage. It is simply a means of trying to keep the Commission and the system generally on their toes.

Lord Lloyd of Kilgerran

135. May I ask a question regarding these projects in so far as they relate to small and medium sized business. I want to put to you the comments that

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Dr GORDON ADAM, MEP and Mr JAMES SPENCE

[Continued]

[Lord Lloyd of Kilgerran *Contd*]

we have had from the European committee of the University of Bristol. To paraphrase, they say that a special directorate-general has been set up to accommodate SME units and specific programmes such as BRITE and EURAM to encourage SMEs to participate via feasibility studies. They say, "This is not enough". Have you therefore any other proposals that would help in that direction? They go on to say that the House of Lords should demand that the Commission gives more weight to SME research development to ensure their potential is allowed fully to develop. This should not so much compromise good science but should facilitate new, ensured European growth. Are you in a position to comment on that broad statement or do you think it rubbish?

(*Dr Adam*) Small are medium sized businesses are very well looked after by the European Parliament.¹

Earl of Lauderdale

136. They are tender plants?

(*Dr Adam*) Not so much tender plants, no, but we do look after them very well. I doubt whether your Lordships would find any resolution of the European Parliament that does not somewhere in it say that due regard must be paid to the requirements of small and medium sized business. People define it differently. We were having a little discussion about this last night. The figure of 200 employees was given as an indicator. You can of course take the number of employees as an indicator or you can take the turnover of the business as an indicator—you have to make your own decision on that. With the science and research projects we have tried very hard to make sure that smaller companies and smaller research organisations are able to take part. I am satisfied myself that the Commission people who deal with these things take all this into account. I know of one small company in my own constituency that has been very successful in dealing with the Commission in becoming involved with a lot of projects and with the training schemes of the Commission also. They have done that through a lot of hard work and attention to detail that is necessary with these programmes. However, there is a problem that does not seem to be addressed in the question. Very often the requirement of the small business is not so much to get involved in research activity but to benefit from the research that is taking place. If there is one weakness that our whole system has at present as I see it, it

is that we do not have a technology applications programme to back up the research and development work that we are doing.

Lord Lloyd of Kilgerran

137. Do you think that the Eureka programme is working well?

(*Dr Adam*) We are not directly involved in the workings of the Eureka programme. We get some information about it, but I am not in a position to comment in any detail as to the effectiveness of it.

Earl of Lauderdale

138. Did you have a chance of looking at it before it got going or did it not come to you at all?

(*Dr Adam*) The Parliament approved a report on the Eureka project and it was approved on 20 May 1988 (see OJC 167, 27 June 1988).

Chairman

139. Before coming on to other questions, Dr Adam, I understand about small and medium sized enterprises, but what about subsidiarity? Does that come into the allocation of funding and the help in Portugal, Greece and other countries?

(*Dr Adam*) I do not see subsidiarity as being a particular problem with the implementation of the programme. The framework programme by design has to be carried out at Community level. That is why we do it. Therefore, I do not think the subsidiarity aspect is an important factor. If one is looking at the regional impact, which perhaps is what is implied in the question in mentioning Greece and some of the other countries. Then again there are problems because in some cases their research and technical development is not as advanced as it is here and in France. I come back to the point that it is the use of the technology that we have that in many cases would be more help to them than to try to get involved in some of the programmes. At the same time there is no doubt that if you want to put a project forward for approval and you can find a partner in Portugal or Greece or Eire, then you will get an extra brownie point for that provided that the technical excellence is there and that it is a good project.

Lord Rodney

140. Dr Adam, may we go back to your submission. I read the submissions that have been given to us and I was quite amazed by the degree of satisfaction that almost everybody seemed to have for the framework programme up to now on nearly all aspects, including your own submission. However, when you came in this morning you streamed off a whole mass of complaints, and I have to admit that I am absolutely confused. Is it because the new next step is totally different from the previous one, or what has happened?

(*Dr Adam*) There is no doubt in my mind that the programme so far has been very successful. I should be very surprised if a lot of evidence to that effect had not come before this Committee. Perhaps I can give some personal experience of this. If one takes

¹Note by the witness:

Since the date of the evidence I have learned of the Commission's most recent proposal for a new co-operation programme for small and medium enterprises. This is to be known as CRAFT (Co-operative Research Action For Technology). It is hoped that three pilot projects will get underway this year. The proposals owe much to the IRDAC Committee, whose Chairman is Sir Geoffrey Allen. It is accepted that SMEs often do not have the means to carry out the technological research necessary for the accomplishment of their projects. The CRAFT project will encourage several SMEs from the same sector to group together, with the help of a research institute which would provide the technology necessary for its successful completion. This is further evidence of the importance and support that the Commission and Parliament attach to this area of activity.

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[Continued]

[Lord Rodney Contd]

the Esprit programme, for instance, the Commission have a special week in Brussels every year now where all the participants come together and there is a whole series of meetings. It is almost like a technology market, the sort of thing one perhaps had in the olden days when people went around the market cross and were given jobs and so forth. A tremendous amount of discussion goes on between people from different countries and views are exchanged and so on. It is a very exciting thing to see. I am quite sure that we probably achieve more in bringing people together in that way than we do even through the programmes that we are supporting. Therefore, I am not surprised that you have had a lot of favourable comment. My position about the framework programmes is generally favourable. We want to see it continue to contribute and to improve. We believe that it can contribute much more in the future. We do not want to be in a situation where in two and a half years' time we may be operating at only 70 per cent of the effort that we are making at present. If one goes back to the Milan European Council meeting in 1985 the European Council at that time indicated a possibility of 6 per cent of the Community budget being applied in this area. The European Parliament took that figure up and it has been our target ever since. We obviously have had to accept that we are not going to reach it very quickly. We hope however that with the next review of the financial perspective we would reach it by the end of 1997. In Current figures that would be an annual expenditure of three billion.

141. I do not quite see what has happened. Everybody is pretty happy with what has happened up to now, and suddenly you come forward and say that everything is terrible or is going to be terrible in the future?

(Dr Adam) I do not know how much evidence you have taken since 19 December, but there has been a change first in the financial commitments, which I believe are going to grow. After all, we are very busy at present setting up the so-called internal market; 1992 is all the discussion. What happens after 1992? I do not believe for a moment this European internal market will be the answer to all our problems, and I would expect the competition from outside will be even greater than it is now. What of our research and development programme in those days? Will 70 per cent of our current effort be enough? Is that the signal we want to give the rest of the world? I do not think so. Since the Council meeting there have been all these changes in Eastern Europe. The potential that our programmes have for linking in with developments in Eastern Europe is enormous. If I may give a very good example of this, within the energy directorate we have had very successful links with China over the years. This is temporarily in suspense because of the political situation there. We made a tremendous contribution to the energy scene in China at no great expense by advising them on the technologies that are available. All this is available for Eastern Europe on the same basis as we have links with the EFTA countries at present, of which I am sure your Lordship will be very knowledgeable. That is the situation.

Lord Gregson

142. When I was an adviser to the Commission on research and development programmes the Commission were always furious at the United Kingdom Government applying the additionality rules. In fact, they used to get quite incensed about it and call people nasty names. I think the reasoning was very good because it meant in the United Kingdom that the Commission could never supplement a United Kingdom programme. As soon as the Commission put some money in place the United Kingdom Government just pulls the rug out from underneath and says, "We'll chop our programme to that extent". Would you like to comment on additionality and give the view of your committee on what I call a rather stupid practice? Do you or Mr Spence have any information about the practice of other countries on this basis?

(Dr Adam) On the broad question the astonishing thing is that I understand the Government claim we get more out of the research programme than we put in. I should have thought that perhaps would be a solution to some of our economic problems if we pushed the effort up a bit further. It is extraordinary to me that not only do we cut back on some of our own research expenditure in the UK but we are a drag on the system when it comes to the Council meetings. We have a firm reputation now of being one country that will always look to cut the amount of expenditure that is initially proposed. While I do not go along with all the Commission's proposals I find it difficult to believe that every single one ought to have its financial allocation cut. Knowing the number of proposals that come forward for support I believe the fact that nationally and in Community terms we are unable to fund them must be a real worry if we want to look at the competitive situation which we will face in future.

143. We actually reached the nonsensical situation in the engineering research council when we were quite delighted when the Commission's programmes were cut because it meant we then did not have to face a cut in our own programmes promulgated by the British Government. I really do wonder how nonsensical one can get in these circumstances!

(Dr Adam) That is one reason why we take this failure to "budgetise" the 200 million ecu; it is not a large sum on its own, but it certainly cuts the effort. Perhaps Mr Spence should say a little about the relative position in other countries, my Lord Chairman.

(Mr Spence) I have two small points, my Lord Chairman. First, the committee itself in its amendments adopted one that said: "The practice by some member nations of attributing to national departmental budgets the amount allocated by the Community to projects awarded to national organisations shall cease", which I think addresses the point. As far as I understand it, I believe that the United Kingdom and Spain are two who practice this as well as, until recently, Germany. However, I am not quite sure whether the rules apply in the same way, and I am afraid I do not have the details of the rules which apply in each of these.

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Dr GORDON ADAM, MEP and Mr JAMES SPENCE

[Continued]

[Lord Gregson *Contd*]

144. You mean that the disease is spreading?
(Mr Spence) I am afraid it sounds as if it is.

Earl of Lauderdale

145. Chairman, may I go back to Dr Adam's interesting opening statement, which came over to me as if he was a Member of the House of Commons or of the House of Lords protesting about the way things are done here, because it is exactly what happens all the time. Has the downgrading, shall we call it, of consultation (I think that is a fair way of describing what he said) which is a very serious matter obviously, not least when one has been pushing for greater centralisation in the Common Market and so on, come about gradually over the years or is it a fairly sudden development?

(Dr Adam) I think that a lot of it at the moment comes from two areas. One is the fact that we have just had elections for the European Parliament and after every election there seems to be almost a quantum leap in activity. A very high proportion of members is completely new and they are anxious to get on with things. There has also been considerable argument between the Parliament and the Commission on the social charter. Many members of the Parliament have taken the view that the Commission has caved in to criticisms from the Council and agreed a document that was a watered-down version of the original. That has led to an increase in tension between Parliament and Commission. What has happened to the framework programme is another evidence of this. In my 10 years on the committee I have never known our relationship with the Commissioner responsible for research matters to be so low. Normally we get on well; we believe that by co-operating together we are achieving a reasonable effort. At present, however, our relationships are not at all good. We cannot accept that the Commission should completely ignore virtually everything that the Parliament says. I am not claiming that everything the Parliament says is marvellous, because it is not. However, if one looks through the documents that we put forward on the framework programme we feel that some of those items could well have been taken into account. In the present stage we would look to the Commission to give us some support in our disagreement with the Council. That is the crux of the problem. The Parliament's disagreement at the moment is primarily with the Council. Unless we get some backing from the Commission in the conciliation process, then of course we will not win anything at all.

Chairman

146. Do you have any say as a parliamentarian over the management structures of the Commission and how they interrelate between the directorates-general or between them and yourselves and your committee?

(Dr Adam) I think we have an influence on how the Commission operates. Some of us are in frequent contact with the people in the Commission, and I am quite sure that our views from time to time are taken into account and perhaps affect the way in which the research directorate or the energy directorate

is organised or the particular emphasis given to a subject. A good example of that would be the work that is now done in the Community's own research centres on the environmental question. Parliament quite early on was pushing research in that direction. Therefore, the influence that is exerted goes well beyond the formal pieces of paper that are passed up to the Council.

Earl of Lauderdale

147. Is it not the case that the European Parliament if it wants to can pass a vote of censure on the Commission and the Commissioners only have to resign and are re-appointed by the governments that appointed them in the first place?

(Dr Adam) That is the position that is in the treaties. The possibility of tabling a motion of censure on the Commission has been talked about in recent weeks. That is the first time in my 10 years' membership where there has been any serious discussion on that at all. The only comparable thing in the past is that there may have been a particular Commissioner lined up for treatment on a particular subject. However, at the moment that is being talked about. Whether the Parliament will get to that stage soon I do not know; nor do I know what would happen if we passed such a notion—no one knows.

148. In fact, it has never been done, has it?

(Dr Adam) No, it has never been done.

Baroness Lockwood

149. Returning to the tone of Dr Adam's evidence, I was very struck by the critical nature of it because I thought in that respect it was quite different from some of the other evidence. On page 2 of the submission he states: "The Framework Programme as presented by the Commission is a very unsatisfactory document, particularly Annex II. It does not contain a statement of objectives and lacks a coherent strategy". Later in the next paragraph he says: "It does not show how the current Framework Programme has produced an improvement of the competitiveness of Community industries, or in what ways their share of world markets has increased". Can Dr Adam tell us what happens when his committee makes comments of this kind? Is it responded to in any way by the Commission? It seems to me that this is a very fundamental criticism.

(Dr Adam) The Commission normally would respond almost straightaway with whatever additional information the parliamentary committee asked for. The criticisms we made of the original programme were in line with many that were made. The common orientation, Annex II, is a considerable improvement on the original, I think we would all agree that the objectives are set out with much more clarity. That is not to say that one necessarily accepts them all, but at least they are there. If you do not have a clear set of objectives I do not see how you can get any programme to work. The question of the competitiveness of Community industries and how all this affects it is something about which we argue endlessly. I would not claim that the Commission could be in a position to set it all down chapter

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Dr GORDON ADAM, MEP and Mr JAMES SPENCE

[Continued]

[Baroness Lockwood *Contd*]

and verse, but I do believe that they ought to try to indicate things more than they do. I have had some evidence in relation to the Esprit programme, for instance, where the director of that programme has been able to give me figures showing how various markets have changed because of their activities. I do not have all the details with me. Perhaps we ought to try to get them and send them to the Committee?

Chairman

150. Thank you, we would be grateful for that.

(*Dr Adam*) I would like to see more of this. I believe that it ought to be part of the monitoring process of the Community's activity.

151. I think you said also, Dr Adam, that more attention should be paid to the use of the technology that was developed or of the research, and I was interested in that. You mentioned Eureka. You think there should be closer co-ordination between the framework programmes and programmes like Eureka; you are saying that you are not given much information on Eureka?

(*Dr Adam*) Parliament would like to be more involved in this.

152. Perhaps you would like to look into this and write to us about it? It is a subject in which we are interested.

(*Dr Adam*) My own position on it is this, my Lord Chairman. I am not convinced by the idea that we have to be away from the market place in all this activity. I think it extraordinary that Nissan can be encouraged to come and build a factory in the north east and we can have the enterprise zones where rating is taken away, yet as soon as we think we are getting near to putting a product on the market Government and the Community has to run away from that process. I think that Government, industry and all the people who are involved in research have to work as a team and make sure that the collective experience is brought into the market as effectively as possible. To that extent the Eureka concept is the right thing, but we believe that it ought to be operating as a full Community instrument. I would like to see this take the form of some sort of technology applications programme so that the industries in the Community could benefit from all the technological experience and know-how that we have. However, that cannot happen without a great deal of effort.

153. Mr Spence, have you something to add to that?

(*Mr Spence*) My Lord Chairman, just on the question of Eureka: one issue raised in the debate in the committee was the role of the Community in the Eureka JESSI programme because it was likely to consist of a large part of one or more of the original specific programmes as proposed by the Commission. The debate in the committee turned on the

extent to which the committee under the current procedures foreseen in the Single European Act was likely to find the powers it currently had did not cover the Community's activities in relation to the JESSI programme.

Baroness Llewelyn-Davies of Hastoe

154. I should like to follow up what Lord Rodney said, Chairman. In the submission—which was incidentally very interesting—you say on the first page that you would prefer the term “enabling” instead of “diffusion”. We get a report of the Council of Ministers and we find that exactly that has been done. I was very worried when you said that there had been no consultation, but surely there must have been interrelation between your comments, which presumably are those of your committee, and the complete change of attitude in the Commission and, presumably, in the Council of Ministers. Can you explain that?

(*Dr Adam*) Not all the comments I made originally were taken up by the Parliament's committee. These were very much my own views.

155. But you seem to have had immense influence somehow?

(*Dr Adam*) On some of the administrative matters perhaps. There was a lot of movement in the rewriting of Annex II. As regards the substance of the Parliament's wish, particularly the emphasis within the energy sector, the additional activities that should take place in the environment and the Parliament wanting to cut back a little in the information technology area, none of that was followed. The Council's financial breakdown—we have the percentage figures here, my Lord Chairman—follow almost identically the original breakdown. The Council in the very slightest way took account of our comments in the energy sector, but we are talking about half a per cent. It would not mean anything in practical terms. As far as some of the changes in direction or emphasis that we wished to see happen were concerned there was no change between the original proposal from the Commission and the Council's decision. One thing that did happen was that Annex II was rewritten, and that is a much better document that it was before.

Chairman

156. Dr Adam, Mr Spence, thank you very much indeed. Please let us know if you feel there are things that you would like to make known to us. I do not know the future course of our enquiry into the framework programme, but—although I think it is unlikely—if we need anything more, perhaps we may get in touch with you again.

(*Dr Adam*) Thank you very much, my Lord Chairman. We will certainly look at the evidence and, if there are any points that have been missed, we will let you know.

THURSDAY 1 FEBRUARY 1990

Present:

Butterworth, L.	Llewelyn-Davies of Hastoe, B.
Chilston, V.	Lockwood, B.
Ironside, L.	Serota, B.
Lauderdale, E.	Shepherd, L. (Chairman)

Memorandum by the Science and Engineering Research Council (SERC)

QUESTION 1

How far is a European programme for R&D desirable at all? Which are the areas where collaboration between the Community and Member States will be most beneficial? Are the six areas identified for Commission support the right ones?

Answer

A European programme for R&D is highly desirable in some areas where the European dimension adds to the science. Research in areas of strategic relevance such as information technology and telecommunications is better carried out on a European scale properly complementing national programmes. Community involvement would not be appropriate in the construction of major facilities in big science areas of, eg particle physics and astronomy; but might assist subsequently in providing a means of access for smaller Member States.

The six areas identified in the Commission's proposed new Framework are too broad to give an overall response on their suitability. In general they cover the right kinds of fields but there is insufficient detail for in depth comment. Line 6 (Human capital and mobility) was one of those not adequately defined. We would be happy with a Community programme to enhance mobility of young scientists which could be operated through the European Science Foundation. We would also support a modest expansion of the existing SCIENCE and Large Science Facilities programmes.

QUESTION 2

What value is such a vague Framework programme as proposed, which gives almost no detail on the scope of particular projects to be covered?

Answer

We agree with the implication that the Framework Programme as originally proposed by the Commission was too vague to be useful. Subsequent work by Member States through Community organs, such as the CREST committee, has produced a better defined Annex II with more—though still insufficient—detail of the areas to be covered.

QUESTION 3

Is the Commission right to propose a new programme rather than revising the existing programme?

Answer

There are legal aspects to this question on which SERC is not qualified to comment. As a general comment we would observe that the existing Framework Programme called only for a mid-term review. The Commission would thus seem to have gone further than they were required in proposing a new Programme; although the "new" programme in many cases is continuing in the areas of the existing Programme, with some changes of emphasis. It is too early to make a detailed evaluation of the existing Framework Programme, although a constructive attempt to do this was made by the Commission's "Wise Men's Report".

QUESTION 4

Has the Commission adequately justified the resources to be made available?

Answer

The Commission has not given sufficient detail to justify the resources requested.

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QUESTION 5

Is the balance of funding between areas correct? In particular, is the Commission right to reduce support for projects concerned with energy?

Answer

SERC is not qualified to comment on the overall balance of funding proposed between areas. We would not want to see any substantial shift towards funding of more basic research unless clear criteria of scientific benefit were satisfied.

QUESTION 6

Does the long-term nature of R&D mean that the Commission is correct to set out funding over the four year life of the projects now? Should decisions about financing after 1992 be taken when it is clearer what budgetary arrangements will apply then? Should a portion of the budget allocation for the programme be set aside as a reserve to cover financing of new projects that may be deemed necessary when the programme is revised in 1992?

Answer

Forward planning of resources is an important discipline for any funding body. The long term nature of R&D does not remove the need for that discipline, but it does mean that sufficient flexibility must be allowed to provide funds for unexpected new areas. The Commission's policy of moving towards a rolling period would be helpful to flexibility. We would prefer a more even profiling of commitment to allow greater flexibility, rather than the creation of a reserve.

QUESTION 7

Does the proposal give sufficient weight to the need for evaluation of projects?

Answer

The proposal as written does not give sufficient weight to evaluation. Since the evaluation needed will differ between the different research programmes which will make up the Framework it is appropriate that the detailed evaluation requirements should be specified in the separate programme proposals which the Commission will bring forward once the overall Framework Programme is agreed.

QUESTION 8

How far does the new programme differ from the existing one? Has the Commission sufficiently justified the changes?

Answer

As we noted above the overall balance of the new Framework proposal differs from the existing one. SERC is not qualified to comment in detail on the question of overall balance, but in our opinion the changes proposed are in the right direction. The Commission's original text of its proposal did not give sufficient detail to justify either the changes, or the level of expenditure proposed. The efforts of Member States have now produced a more satisfactory document.

QUESTION 9

In setting up programmes, is the Commission really clear about its priorities as to:

- (a) the balance between research and development;*
- (b) the balance between basic and applied research;*
- (c) how "near the market" it is proposing to fund projects?*

Answer

No single answer can be given to these questions. Judgments on these balances must be made for each programme and will differ between different sectors and areas of research. It is not always either necessary or desirable to fix, in advance, a formula for the balance between research and development or between basic and applied research. Often a complex mixture is required, which evolves over time. It is not our experience that the Commission is any better or worse than national authorities in this area.

In general we support the Commission's general trend to move away from the support of near-market research. As we stated earlier however we would not welcome too dominant a role for the Community in fundamental curiosity driven research.

QUESTION 10

The Commission has so far failed to review the existing Framework Programme. Is evaluation an essential element in research programmes? Does the Commission have adequate procedures to evaluate programmes

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and is it able to ensure that those of little worth are closed down? Are you satisfied with "peer review" as a method of evaluation?

Answer

Evaluation is an essential element in research programmes. The form it takes varies according to the type of research, and differs for example between that needed for basic curiosity-driven research and for applied research of industrial relevance. The Commission's procedures are similarly varied. In some areas, eg biotechnology the Commission has been more effective in monitoring on-going work and independently evaluating the results of completed programmes, than in the original selection of proposals. This tends to be done in a hurry without adequate peer review. Too many applicants are stimulated to apply for limited resources with the result that much time is wasted by both applicants and Commission. A two-stage process involving pre-selection of initial draft proposals would be more cost-effective. Greater attention needs to be paid to the effective operation of the Commission's management committees (CGCs), where decisions on funding are actually made, and where both scientific and political representation are needed.

In other areas, eg ESPRIT the initial evaluation of proposals is carried out thoroughly and effectively by appropriate independent experts, reporting to the ESPRIT Management Committee (EMC). Monitoring of on-going projects is carried out by "project monitors", also reporting to EMC, but there are insufficient of these to cover the large number of projects in sufficient depth. More use could be made of national experts. The ESPRIT Management Committee is nevertheless prepared to close down unproductive projects and switch partners. The results of the ESPRIT I were taken into account in ESPRIT II.

Applications for support under the SCIENCE programme are sent by the Commission to independent referees throughout Europe, and then assessed for support by the Commission's advisory body of senior scientists (CODEST). Some members of this body (including UK members) are also given independent scientific advice on applications via national research funding bodies (in the UK, the Research Councils). Although we believe that the results obtained by these procedures are broadly just, the level of seniority of CODEST members is not wholly suitable for the detailed assessment process involved.

"Peer review" is the most effective form of scientific assessment to make decisions between competing proposals for basic research in the same field. It needs to be complemented by other forms of evaluation in more applied research.

QUESTION 11

How far should research funded by the Community be directed research rather than reactive research?

Answer

This varies between programmes. As a general rule the Commission, advised by Member States, should as now identify the broad topics of research to be undertaken under agreed programmes. Detailed research projects, within those topics, should be funded "reactively" with the criteria of excellence and relevance to the programme being used for selection.

QUESTION 12

Is the strengthening of European competitiveness a sufficient justification for the Community undertaking research already underway elsewhere in the world? Does the increasing number of areas of Community activity mean that there will be a growing need for research in new areas?

Answer

There are aspects of this question, concerned with Community competence, on which SERC is not qualified to comment. We would however make the general observation that for a nation or region to take maximum advantage of research undertaken elsewhere, it needs itself to be actively involved in the same areas of science. The Member States of the Community, taken together, should be of sufficient economic size to be able to compete internationally in virtually all areas of science and technology. The requirement is to make the whole European S&T effort greater than the sum of its individual parts. The European Commission can have a role in this, in the concertation of national activities, while respecting its own principle of "subsidiarity".

QUESTION 13

Are the details of the projects settled sufficiently far in advance? Is it of concern that the Commission has been able to start new projects without political backing. Do you have any comments on the aeronautics programme agreed last year?

Answer

The details of projects are not always settled sufficiently in advance. There are two problems: the rate at which new programmes are negotiated through the European Council machinery does not always give

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sufficient time for thorough consultation and once new programmes are agreed, deadlines for the submission of applications are sometimes too short to allow adequate preparation.

QUESTION 14

Should the Commission give emphasis when supporting particular projects to those which strengthen the economic and social cohesion of the Community and which encourage the role of small and medium sized enterprises? If so, can this be done without sacrificing the level of excellence of programmes?

Answer

Measures to strengthen the economic and social cohesion of the Community, and to encourage the role of SMEs, should be identified as such, and funded only from sources clearly devoted to those objectives. The criterion of excellence of R&D programmes should not be compromised by the confusion of objectives.

Examination of witnesses

Professor E W J MITCHELL, Mr J R MERCHANT and Dr D M WORSNIP, Science and Engineering Research Council, called in and examined.

Chairman

157. We are grateful that you have agreed to appear before the Committee and help us with our inquiry. Is there anything that you would like to say at the outset, Professor Mitchell?

(Professor Mitchell) Thank you, my Lord Chairman. Perhaps I may explain that Mr Merchant is Secretary of the Council and Dr Worsnip has been very much concerned with the way that the Esprit programme has been handled and has detailed knowledge of that. If I may take a couple of minutes, I should like to make one or two points at the outset to clarify the role of the SERC in relation to the EC. We have traditionally had a major set of co-operations in Europe before the EC and in parallel to that. We spend something like 25 per cent of our funds in European interactions outside the EC for things like CERN, the particle physics research organisation, the space agency and so on, so we are not strangers to the business of collaborating with Europe. Perhaps I may explain briefly the things that we do in this country, as it throws into focus and gives a context for the way we operate in relation to the EC. Our budget is just over £400 million. We achieve science and engineering objectives by working through the higher education institutions, the universities and the polytechnics, and we make grants to universities and polytechnics for research projects—including research assistants usually for three years. Something approaching 40 per cent of our funds go directly into universities and polytechnics for supporting work. A grant may be £20,000, it may be £1 million. In addition we have facilities in our own laboratories which are too large or too complex for operation on university or polytechnic sites. We have four laboratories around the country, Rutherford Appleton Laboratory, Daresbury Laboratory in Cheshire and two observatory bases (Royal Observatory Edinburgh and the Royal Greenwich Observatory), for telescopes which are national but happen to be overseas—La Palma, for example. Those facilities are for use by the staff of the higher education institutions. Our laboratories are quite different from the laboratories of the AFRC or NERC which are free standing research

institutes. We of course encourage our laboratories to do some research, but their main role is to support the HEIs. Then we support international facilities, most of which as I mentioned are European and I described at the beginning, CERN, the European Space Agency and the radar in northern Scandinavia for the ionosphere. The final category is graduate training for which we give bursaries or studentships. We support across science and engineering about 9,500 graduate students. The point of that—and thank you for giving me the opportunity—is to illustrate that our major interaction with the EC is indirect. What concerns us is that our customers, namely, staff in the HEIs, universities and polytechnics, also get the best out of the EC. We want to do that because we want to be quite clear that our money and money flowing into the HEI from Brussels are complementary and not duplicating things. To get the best value out of our money that goes into the universities we like to see them doing as much as they can to get funds from Brussels. It is an indirect process in that sense. Nevertheless we think it incredibly important. We are a very active partner in the UK Research Council's European Office in Brussels. During the time when there is a major programme discussion going on, for example, as indeed there was some while ago on Esprit, a member of staff—in that case it was Dr Worsnip—would spend a significant amount of time, two days a week, in Brussels. This is to aid the HEIs to get money so we can correlate well with the UK. Indeed Dr Worsnip (maybe he will say this later) would organise what we call town meetings of the likely communities so they can discuss things that would go to Brussels and things that would come to us. The point I wish to make then, my Lord Chairman, is: yes, we are very much involved, but in that particular area it is an indirect involvement in that the money is not coming directly to us to disburse but is going to our customers to whom we also give money and we want to see a good sense of balance between them. We also have some direct interaction, things that are going on in our laboratories—Rutherford near Oxford, the Cheshire laboratory (Daresbury) and the two Observatories—have interests in their research and the techniques they have available that

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can themselves attract EC funds. That is a direct interaction where money comes to us. For example, at Daresbury Laboratory we have one of the world's leading new types of machine for producing X-rays. Not long ago that machine indeed was used to measure the structure of the foot and mouth virus, which is a very good breakthrough. It is as good a machine as any in Europe at the moment until the combined European one is built. Incidentally, the European one that will be built and in which we are a partner, will be built independently of the EC. The EC is very keen that particularly smaller countries that do not have access to such a source of X-rays should have such access. We have concluded an agreement in the EC Large Facilities Programme that I will perhaps mention later. That is therefore a direct involvement, and I just make that distinction. The context of working of SERC therefore is not primarily one that money comes directly to us; we try to encourage the HEIs to interact in a productive way, and at a much smaller scale we have some direct interaction into our laboratories. That would perhaps explain the situation and I will try to deal with questions.

158. That is very interesting. One presumes that your work is more directed towards the UK, looking after the interests of the UK. Within the Community countries are there similar organisations to you? How similar are they?

(Professor Mitchell) Roughly speaking, my Lord Chairman, the answer is yes. For example, there is the CNRS, Centre National de la Recherche Scientifique, in France, which is very much like the SERC, a little wider in its scope but essentially a research council. It has rather more laboratories of its own than we do, but then that pattern varies between the Councils in the UK. In Germany—in detail they vary a little—there is a similar organisation, the DFG gives out grants and the facilities are run by the BMFT. It is essentially the same. In Italy there is a very similar organisation to ourselves.

Earl of Lauderdale

159. What is the BMFT?

(Professor Mitchell) It is the Bundesministerium für Forschung und Technologie. It is the one that Herr Riesenhuber heads.

Baroness Serota

160. What relationships are there between the different Councils that you have just mentioned and those in the UK?

(Professor Mitchell) There are no formal relationships. Let me take as an example the CNRS in France and ourselves, and the same would apply to the CNR in Italy and the DFG in Germany: there are no formal relationships, but we have frequent meetings. For example, I was in France last Friday and the Director General of the CNRS is coming to talk to us at the end of February. There are meetings with officials. I suppose that one way or the other there must be at fairly high level, perhaps half a dozen, meetings a year. In addition to that, although

this is slightly wider but it does bring in the other European ones, the Presidents of Research Councils of the Summit countries meet once a year for totally informal discussion. Although that includes the United States, Japan and Canada it also includes France, Germany, Italy and Sweden.

Chairman

161. How far can the Commission draw upon your experience and the experience of similar organisations to yours? We have had evidence that the Commission is relatively small and their resources are not very large. Would there not be some advantage to the Community countries if there was a more formal relationship between the Commission and yourselves as opposed to this rather ponderous system of Council of Ministers and so on?

(Professor Mitchell) That is a very interesting question, my Lord Chairman. The situation at the moment is that the Commission appears not to want formal interactions with bodies such as ourselves.

162. Why?

(Professor Mitchell) Perhaps I can go on and come to why, my Lord Chairman. For example, as to people that we use for refereeing our own proposals in our peer review system, we communicate those names informally and sometimes quasi-formally as suggestions to the Commission to use. There is therefore an interaction in that sense in that our experts in particular fields as referees, for our peer review system, are known to the Commission and are used by the Commission: but they are used on an individual basis although the names initially are channelled through us when it relates to us. I know that that goes on with the other research councils: the Germans I know do the same, and the French do the same. Why do they work that way and not work directly with the SERC, the CNRS and so on? It is due somehow, I think, to the fact that they want to be seen to be acting in some independent way, and not be simply a kind of consensus sum of existing funding organisations. There are a number of disadvantages in that, I think, because we as an organisation do not have any direct input to the Commission.

163. It seems to me a bit of a vacuum. If you have a view that you think the Commission should have, how would you put it to the Commission?

(Professor Mitchell) If I or my colleagues have a view there is no doubt we can feed it in. That is no problem.

164. Officially?

(Professor Mitchell) We feed it in in an informal way. Our formal route is to the DES and to the Cabinet Office at the time of the discussion at the initial stages of the programme. Happening now, for instance, after the agreement that was made in December, which was the Framework Programme and the most recent annex to it, which I am sure you will have had, that is now all being fleshed out by working groups and scientists, and we certainly get people on to those. The point I was going to make,

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[Continued

[Chairman Contd]

my Lord Chairman, relates to the attribution issue. I did not know whether you wanted to take that now?

165. I think we should.

(Professor Mitchell) If we take the stage of the Framework decision in December, we have very direct input in the UK system—certainly we have some input through the DES and Cabinet Office—to those decisions. The decisions at that level in the December meeting of the Council of Ministers will set out things like the Framework Programme and will be the result of advice that has gone in. There may well be a political element in the decisions. Incidentally, the logic of the attribution system is impeccable; I do not dispute the logic of the attribution system, which is the control of public expenditure wherever it goes, so I am not questioning the ultimate logic. I look at the effects then as one comes down the system to a body like us. The attribution system says: these programmes, which of course are not yet programmes in the sense of money coming but they are programmes described in your papers on the Framework Programme, have somehow—to the value of the UK share of about 18 per cent—got to appear somewhere in Departmental budgets, estimates or whatever. This has not been a problem in the Science Vote hitherto because on the whole the Commission's activities have been very much in the enabling technologies, which have been in relation to DTI, but it is now spreading into the science area so the worry I am expressing has not been present before. There might be a decision, such-and-such a part of the Framework decision relates to things dealt with by the Science Vote and the DES; hence that sum has to be seen in the EuroPES line with therefore a diminished vote in the DES for that purpose. What I now say is conjecture because we have not been round this track before. My conjecture is then that the DES would say: "Of course on those sort of programmes, as far as we can see"—and, of course, the evidence it has is the kind of evidence that is in Annex II, of the Framework and not more detailed—"it looks as if £X million are things concerning the SERC". Therefore, in order for DES to find a sum that they have to find under the EuroPES agreement they will say, "Well, SERC, this appears to be your area, we will decrease your budget by so much to cover this sum". We can of course then press back to say at the public expenditure survey hearing, "That is so difficult for us that we shall make a PES bid", and that of course is one way. If I can try to illustrate the sort of worry we have—and if this gets too complicated, please tell me, it is complicated in a scientific sense—at our Rutherford Appleton Laboratory as at Daresbury Laboratory we have things which come under the heading of large facilities. There are programmes on them that have highest priority from the SERC. There is also an area on the machine that we have quite deliberately decided not to go into but which could be achieved parasitically on this machine. The machine produces neutrons for research into the properties of solids and liquids, chemistry, biology and materials, but it can also produce another kind of particle, regarding which I will not go into now.

There is no doubt that there is very interesting work to do using that particle (the nuon), not in nuclear physics, not in particle physics, but in solid state physics, in chemistry and so on. We have decided, under the pressure of funds, that that is a field that we do not wish to go into. That is not saying it is not good, it is fine, but we have to make choices. It turns out that the French and the Germans have a different view. They have put up some money and we have gone through the EC Larger Facilities Programme with them and others and have got money for EC countries to come and use this machine for that purpose. In general terms that is excellent. If you now go back and see what the effect is—excluding from this discussion the possibility of a PES bid, I agree that is always possible—there is a sum of money we have which, if you follow my conjecture through, is then decreased because of the outline programme that was agreed in December. If one carries that logic through, we would then have to stop certain high priority things. We then get something back from the EC in relation to this Large Facilities Programme, the programme that the French and Germans would like to do, which we would be very happy for them to do, as it were, on top of our programme, but it was not on top of our programme, and in finding the money to meet the EuroPES, we would have to shut our high priority things and accept a thing that previously we considered a lower priority. One could say, "You need not accept it". That is perfectly true, but then we still have the shortfall of the money. This—the detailed future operation of the attribution system—is a worry for us. All I think I am arguing for, my Lord Chairman, is that there should be some flexibility in the way it is operated so that one does not get into what could be described as silly situations—or at least I would describe them that way.

166. How do you get flexibility? These financial arrangements are done on a strict annual basis, are they not? Can you carry things forward?

(Professor Mitchell) During the past year the Treasury have agreed that we have a 2 per cent carry forward.

167. That would be miniscule in the light of what you are saying?

(Professor Mitchell) Yes, it is not big enough, I agree. May I take another example, let us say on the grant side, supposing it was something that also came into the DES area. We would suffer a decrease and the individual receiving grants would also no doubt be in receipt of money from us. I would not say we would actually carry this down into the detail of deducting our grant from that but somewhere we would have to find that money. Therefore, somewhere—this is where it relates to your question, my Lord Chairman—decisions taken in which we have no formal representation would be transcending our priority views of things within our domestic budget.

168. It is the Boston tea party, is it not?

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(Professor Mitchell) Yes, no representation! Personally, I do not want to go on more about this, but it is a worry that many of us have.

Baroness Serota

169. I am not sure I have followed Professor Mitchell correctly, Chairman. He has just spoken about the decrease in grant which forces certain changes in direction of research policy. What about the principle of additionality?

(Professor Mitchell) As I understand that—or non-additionality, as the case may be—it is that such money as we actually receive is not further deducted.

170. Yes, quite.

(Professor Mitchell) Let us say it is a case of our requiring money for this Large Facilities Programme. The gap, assuming it fell down from DES to us, that we would have to make would be offset by the money that came from the EC. It did not add it further on, further attribution, and that is fine, we have no objection to that. However, the situation you can finish in if you are not careful is that what that means is that from the money that would be deducted, some would come back, but for a programme that was not our highest priority programme.

171. I am still not clear: why is the money reduced?

(Professor Mitchell) Let us say that £10 million of the programme that is perceived from the Framework discussion in December relates to DES and SERC work. The principle of attribution—of which, as I say, I think the logic is impeccable in detail—is that that will represent (if nothing else is done) an added amount to public expenditure.

172. That is additionality?

(Professor Mitchell) The Government would say: as a Government we wish to look at public expenditure in total, what happens in the UK plus what comes out of that programme. Hence, in order to come to some agreed target, the individual budgets are reduced, against which one can appeal. I am trying to carry the logic of that down as to how it affects us. I think then it can get into slightly strange positions. The flexibility which you asked about earlier is difficult. The flexibility, I would argue, is that when it comes to the PES bid I could recite this story and say, "Look, this is so ridiculous that really you must give us some money on the PES bid".

Chairman

173. That is nearly cloud-cuckooland, is it not?

(Professor Mitchell) You said it, my Lord Chairman!

Lord Butterworth

174. Can you clear my mind? I am an innocent chap.

(Professor Mitchell) You and I have met many times before, Lord Butterworth!

175. Is the position this: in PES there was a grant

that represented what we were going to pay to Europe and what you are saying is that whatever grant we make to the EC, if in the Framework Programme there is something new that is added which would fall within the responsibility of SERC were it being done in this country, your grant will be reduced by that amount as a contribution to the grant we are making to the EC?

(Professor Mitchell) That is my conjectural interpretation of how the process is worked out.

176. The Treasury (and I would not wish to put words into their mouth either), it seems to me, are saying to you that that is your area of interest and therefore it is up to you to stimulate your academics to get that money back again?

(Professor Mitchell) Yes.

177. Let me take you on to the next thing because we slipped over it rather at the beginning. I think you said quite rightly that the SERC encourages HEIs to apply and interact in the Community field. How successful are you? Do you find that academics are anxious to apply? How successful are British academics at applying and how willing are they to apply?

(Professor Mitchell) May I make one comment on your first point. You are quite right that the effect of Treasury view is to encourage us all to go and get the money back. However, the programmes have been fixed without our direct influence, which is where all this comes to my Lord Chairman's question. Of course we push people to get the money back, but it may or may not be—in a certain number of cases it certainly will not be—for programmes we thought ourselves were the highest priority, so, yes, we must go and get money back, but it is capable of modifying our priorities. That is the worry. If we had a good say in fixing those priorities, as my Lord Chairman says in relation to Boston, perhaps we would have less cause for complaint. I must make it clear that this process has not happened yet. Certainly the EuroPES reductions have happened, but it has not come into the Science Vote yet.

Chairman

178. How has it affected other Councils? You are expressing a concern about something that has not yet affected you, but have other Councils found themselves in the situation that you are anticipating yourself?

(Professor Mitchell) Not other Councils because they are all part of the Science Vote and the argument I have just put would apply to them. In regard to other Departments I am not too well versed in this but I understand that when the Ministry of Agriculture Fisheries and Food had its allocation of PES to cover some parts of the Community research budget, one way it did it was by cutting back on the Rothschild contracted work to the AFRC. I heard that from the present Secretary of State's lips, DES, yesterday. There is not any experience in the Research Councils directly at present from the new Framework Programme and we are trying to follow the

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logic of the operation through and see the consequences of it. Perhaps I may follow up Lord Butterworth's question—how keen are the HEIs to go in and fight for the funds? It varies. One would expect that. Some are very successful and some fields are more successful than other fields. I will not read out a lot of statistics—perhaps we may submit you some—but let me give an indication. On the Esprit II programme the UK higher education institutions receive back £27 million and the UK overall in that programme's collaborative interest in universities received £113 million so it is a significant sum, and the universities did very well in this programme. If I can extrapolate from that what characteristic there is about that which appears to have been good, I think it is that in the UK there is now a well focused organisation for handling the IT. In fact it has followed from Alvey. Alvey had certain limitations; it did a very good job but now we have an IT advisory board between ourselves and the DTI and we put in £30 million a year into the HEIs and it is essentially done by that advisory board, which Dr Worsnip helps to serve. Where there is an organisation, and coherent, like information technology, there is a good interaction and good impact. We have people on the committees in the EC and Dr Worsnip spends time on this and so on. That is a very good example.

Lord Butterworth

179. Let me ask about another area. I realise that information technology and particularly your collaboration with the DTI has been absolutely first class. Talking to biologists and people in biotechnology I sometimes get the impression that the ablest, those who have absolutely first class projects, are reluctant to apply to the Community for a number of reasons. First, they say they can succeed more quickly by other routes. If they take the European route, first, they have to have collaborators in other countries. They go through all the hassle of organising this. Then, even if they get a grant, it is one that does not cover the whole project. I refer to someone who is really first class and successful. That sort of chap says: "I can get the money more quickly and more easily by going to an industrial company or a foundation and I can get the whole grant funded so why should I suffer the hassle of Europe when I am only going to get part of the funding anyhow?" Would that be a fair description of the experience of some people in biology and biotechnology?

(Professor Mitchell) I would think it is a fair description of some people in biotechnology, yes—I would qualify about biology and say something slightly different. That is expressing a view that I think a number of people in smaller sciences (a minority actually, I believe) would have. I think there is a slightly complacent fallacy in it even though you have referred to a first class chap. Increasingly in subjects like that I think it is a mistake to believe we can go on and those groups can go on without interaction with colleagues in Europe. Certainly the expedient argument would be, yes, it is a mess, it is bureaucratic and it is a hassle, and I have heard that myself. On the other hand, I have heard from the

other side, including biotechnology, cases where people have gone through that and say they are benefitting enormously from the information pool that it opens them up to. In biotechnology, for example, there was in the Commission a difficulty. We have referred to that in one of our comments. There were enormous numbers of applications. People's expectations were encouraged and then dashed because there was something like a 15 per cent success rate. We get criticised for ours being low, but ours is something like 30 per cent overall. I would say if that kind of situation occurs in any subject they should operate some kind of pre-selection system on the basis of shorter initial submission so that fewer people would then put in the detailed work and the detailed application. That is one possibility. The other possibility is this. If the bit of the subject is such that it can operate like information technology, like Esprit, and all subjects cannot operate that way, then programmes can be defined, not in a way that ties people down absolutely, but in a more complete way such that people can identify—"Our particular expertise really does not match that and there is no point in our applying". I think there was a problem in bio-technology. My overall feeling from personal experience, and from the experience of colleagues who have been involved in collaborations is that the business of interacting with the EC as far as the communities we represent are concerned is not just another source of money. I know some people take that view but I believe there is an added dimension coming from working in that way. If one takes biotechnology, the UK is involved in more projects than any other country, in spite of what has just been said, and not only HEIs, of course (though HEIs certainly will always be collaborative) and what that gives the UK and indeed anyone in any project is the availability of the results on all those projects so that it opens up an enormous entrée to research data. One could say, well, you go to a conference and you publish results, but I refer to an earlier stage when it can still influence the way one is doing one's own research. However distinguished the individual you referred to, in the long run I would still think it is shortsighted. In the immediate run if he or she wants to operate that way, well that is his or her choice.

Lord Butterworth] This is very important, Chairman. I wonder whether we could ask Professor Mitchell to write to us and give us, say, two examples where these additional benefits become clear. If we had two or three concrete examples to look at rather than talking in generalities I think it would help to illuminate the subject.

Chairman

180. Professor Mitchell nods his head, so thank you, we look forward to seeing those examples.

(Professor Mitchell) My Lord Chairman, another problem with which I think Lord Butterworth is very familiar and which I hope we will get right from now on is that there has not been an equivalent coherent body in relation to bio-technology to what there has

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been in the committee we have jointly with the DTI for information technology. As you will know, we have set up a precisely identical body called BJAB, the Biotechnology Joint Advisory board—this is as bad as Brussels, I am sorry, one gets into the habit!

Lord Butterworth

181. Would this be Professor Whittenbury?

(*Professor Mitchell*) He is on it, yes. It is a joint committee. It is not the particular thing he did earlier but joint with the DTI and SERC. NERC has now joined, and AFRC is about to join. I hope therefore we will have an organisation capable of influencing Brussels in the way the IT people have.

Lord Ironside

182. I was interested in what Professor Mitchell had to say. I have a lot of experience with getting R&D contracts in Brussels. I have not been involved for some time but I do not think it has changed much from what I hear you say now. Over the years we have seen all these R & D programmes that have come up, and there are lots of them now such as THERMIE, BRITE, SPRINT, RACE, FAST—and I do not know how fast we really are going—and we are now seeing the change occurring. Where originally a contractor was working on his own and bidding on his own, they then said, right, contractors must work with industry or with universities, and that has been broadened still further into working across frontiers and working with people in EFTA. What do you think the effect has been on the success of the work commissioned by the EC because of this spread? The spread has introduced more collaboration, but whether it has produced more effectiveness I really do not know. That is my question. Perhaps I may comment on what was said previously. What I see is that some people are good at getting contracts in Brussels. There is a lot of competition there and tricks of the trade and you have to know how to do it. If you go there and sell yourself and talk to people you find ways of getting the work. This is what I find. They say, you come and chat us up, we are not going to chat you up and we are not going to tell you what to do. You have to go to them. I see that life is still competitive as much as it ever was in getting business in Brussels. I do not think anything has changed. Your idea on working up to programmes by having pre-selection, consultative committees and consultation processes is probably a good one now the whole thing has broadened out so much, and it would perhaps help to stop the rot, as one might say. On the question of universities seeking funds themselves and the higher education institutes, what I see is that the universities do not have salesmen and people who can go and market themselves, and they are not very good at marketing anyway. Therefore, if they do get jobs they are likely to get them with an industrial company in the lead or something like that. Then they can respond very well. I would be interested in what you have to say about the broadening of this whole R&D business.

(*Professor Mitchell*) The noble Lord has brought up many issues.

183. They are the same as they ever were.

(*Professor Mitchell*) Indeed, I am just trying to separate my answers. May I take them as they occur to me. First, the ability of the universities and polytechnics: some universities have made a big effort in this. Strathclyde is one, and very successful. The UK Research Councils' European Office is funded by money from Councils themselves but also with a subscription from universities so they can utilise it and it helps put them into contacts such as the noble Lord has described. I would not dispute that if you go and sell yourself and your programme and find your way round things, things may happen, and they certainly will not happen if you simply sit down in your laboratory in the UK. I do not therefore deny that. However, I think you will not get a bad programme through by that means because in all these cases there is a peer review or equivalent mechanism. If say we took a set of our good people who are in receipt of grants, some might sell themselves in Brussels and some might not. What you will not achieve by that route is, in whatever field, success, if your programme is not up to the standard (the standard is forced up by the wider involvement in Europe). A poor programme will not get through, though there may be rare exceptions. In relation to the Science Programme we have looked at that issue. There was a rumour, "Ah, yes, Brussels is picking up our rejected alphas". This is not true. On the whole people who get the money out are the people who are getting grants from us anyway. Nevertheless, if one looks at the subset, I am sure those who are getting our grants who then sell themselves in Brussels succeed and those who do not do not succeed, so, yes, I agree with that, but I do not think you can use that to promote bad programmes. On the extensions over the years from the beginning until, let us say, the present situation, I think the driving force for much of the Community's research programme is the underpinning of European industry. That seems to me reasonably to imply an objective to achieve something greater than can be achieved by some particular industry in an individual country: it is the precompetitive stage of applicable research, and seems to be a sensible way forward involving firms between the countries and HEIs with firms. It is true that the lead contractor takes the brunt of the hassle and effort. I in no way blame them, but it is administratively simpler for a university to be associated with an industrial activity in this country by choice and for that industry to take the hassle of the Brussels negotiations. Some do that and some, who are leading players in a field like optoelectronics, lead themselves. The question of whether it is getting anywhere is a very interesting question. In the IT area there has been a great stimulation on the European scale of the IT companies. The collaboration in other fields—the Euratom field, the work done on magnetic materials, magnets and new materials for magnets—again I think is good. The danger of this is that I produce one or two examples, yet we are talking about some enormous spread of things. The evaluation issue, which in a sense you are coming on to, is part of the question,

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that is, the evaluation of success in relation to the goals needs continuing attention. There are two kinds, I think. Since the objective is to underpin industry on a European scale and in new, and especially inter-disciplinary, fields the question of how many of these things have got through into industry should be looked at and of course there is a reasonable mechanism for that by observing Eureka. That is a separate activity, but one would anticipate if all this is going in a positive way things should happen that would lead to Eureka programmes. I know that is outside the EC but European industry is taking up these developments. There has to be some assessment of that. Our anecdotal experience at present would be that things were moving positively. In the Esprit case I believe that would be true. The evaluation is a tricky business. There are various kinds of evaluation. You can say that both companies and HEIs have to cross country boundaries and there can be a structural evaluation—"How many collaborators were there, how many universities here and there?"—and that is important. SERC feels that the issue has also got to be tackled about the content of the results, the value judgment on the nature of the results. We have this discussion in our own things. That is being looked at but needs to be looked at some more. Ultimately of course there is the question of whether it is feeding into industry, that is a time scale of five or six years, I guess, and all we have really is the second Framework Programme—the first was small—and we should be addressing the issue on the second one. There is another kind of evaluation to which you alluded in the question which I might pick up. There is the evaluation of the individual projects: has what was alleged happened, has the industry been stimulated? There are tests. That I think should be a continuing part of the look at the Commission's programme. The structural ones are certainly important but that roughly means, are people playing according to the rules, and that is easy to answer. The more difficult one is, has there been added value from the European dimension, which is what we really want to know. There is also the overall evaluation, has the whole concept been proven? The Framework decisions of December last year said 15 lines of things. That has resulted from debates with officials from all countries, and indirectly we fed in. At some stage that itself should be reviewed—were these the right choices? I am sure the committee has had a copy of the report of the Wise Men, Dr Colombo, Sir Geoffrey Allen and so on. I think that is a very interesting document. They were asked to do this in a ridiculously short time. We have been involved indirectly in reviews of other major international activities. The Government, for example (and we were involved) pressed for and achieved a review of CERN, the particle physics research laboratory in Geneva, to which we contribute £50 million a year. That was conducted by a set of people who had all sorts of expertise but were not particle physicists—Professor Abragam who produced the Abragam review. They conducted a review about that organisation. There is one that has just reported by Professor Pinkau and various

colleagues, industrialists, academics, on the European Space Agency. The concept is a little like the concept of the wise men, Sir Geoffrey Allen, Drs. Aigrain, and Colombo and whoever the others were. It seems to me over the whole programme somewhere round 1991, before one comes up to the 1992 review, there ought to be a review of that kind on the general headings of the programme, assuming always that the individual project assessment is going on all the time. For the overall review I think one starts looking at the total set of achievements. That review needs to be by distinguished European scientists, engineers, industrialists academics, and needs some time. Abragam had a year and Pinkau had nearly a year.

Chairman

184. Would it not be better to have it as a rolling review?

(Professor Mitchell) I think it ought to be done at some stage for each Framework Programme. It could not have been done during 1989 thoroughly because the programme was going on to 1991. That is the problem that comes through. Nevertheless, I think it was a valuable exercise.

Baroness Llewelyn-Davies of Hastoe

185. We are very concerned about evaluation and one of my questions was going to be exactly about that. Thank you for your full answer. For the progress of our work—we have to decide how to go on—I wanted to ask what you made of the Council of Ministers decision in December? Was it a good decision, did you approve of the rolling business and so on? We would like to know that in general terms.

(Professor Mitchell) There were I think some shortcomings in the previous programme. It was more complicated perhaps than it need have been, there were so many headings and so on. That is one point. Secondly, as I think Lord Ironside knows, it is not an effective way of spending money—certainly not in research—to have a five-year chunk and say you have got to spend that in that period. The profile is totally wrong. I think both these things have been improved in the new Framework Programme. The concept of the enabling technologies, of the environment, which includes the human resource and the mobility programme, contained in 15 lines, is a very clearcut scheme. It is an improvement. The funding arrangements are quite interesting. It is difficult to work out what some of the decisions mean year by year. We have tried to estimate that with certain assumptions. There is the hangover from the previous programme, there is a year or two agreed and there is some new money. In 1991 and 1992 the programme rises according to our rough calculations depending on how the instance of expenditure falls to 1.9 billion ecu in 1991 and 2.1 billion ecu in 1992, while 1993 and 1994 as so far agreed will be much lower. The Community said that would be reviewed in 1992. We wondered how it was the Commission all of a sudden agreed to this, which on the surface is an agreement to 5.7 billion ecu, when they were

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asking for 7.7 billion ecu. If one looks at what is in the years 1991 and 1992 it is running at a rate, if one did it on a five-year period, of nearly 10 billion ecu. Thus 1991 and 1992 are very good years for the Commission in this business and there is the promise of a review in 1992 and the projected figures at this stage for 1993-94, that cannot be the budget under any circumstances. I think that moving to a rolling grant is a good thing. Simplifying the headings for this level I think is a good thing. That has to be seen in the context of the kind of review I am talking about, I think, which is done in time for the new decisions during 1992, which will relate to 1993-94 and beyond. By this means there will be two years always which would be reasonably funded and seen to be.

Baroness Lockwood

186. What Professor Mitchell has said has reinforced my view that there is a great deal of value in the Framework Programmes. I am concerned about what he said earlier about the structure and input that SERC has. If we are going to evaluate the programme as he has suggested we need to look at the structures to see how we can get the best out of this. I see a number of difficulties. SERC is only one of five research councils in the UK. How far has ABRC been involved? Who sets the lines in the first place? Is it done as a policy issue by the Council of Ministers? Is it left to the Commission officials to draw up a draft programme? They do not have sufficient research staff to do this in an adequate way so there must be some feed-in from the scientists within the Community. What kind of structures would you suggest?

(*Professor Mitchell*) May I comment on something that happened in relation to this particular programme. You mentioned the ABRC. The new-style ABRC I think will have to be a coherent focus for those things which relate to UK Research Councils in relation to Europe. That has not happened previously. There have frequently been on the agenda discussions involving European issues, but it will have to be more active in that way. Where does Professor Fasella, for example, get his programme from? He gets around a lot and he talks to people, as do his staff. Ideas are fed in by that process. I had lunch with him a few months ago before the programme and we discussed a number of matters. There is a route in, which he does throughout Europe, there is no question of that. Specifically within the UK in relation to the science programme the DES held a meeting with the Research Councils. You will recall that the ABRC is an advisory body to the Secretary of State and the spending Councils relate managerially to the Secretary of State, DES. At the meeting the DES said, should we be feeding in any thoughts into the formulations. This was last June. We had a preliminary discussion, that is, all Councils, with the DES—the Cabinet Office was represented—and we had some thoughts. To backtrack slightly about the criteria—what is the added value you can hope to get? I believe it is one of two kinds. There are things that are large, costly facilities and on the whole those have been done

outside the EC, like CERN and so on where one cannot go alone. The other thing is the many wide subjects that one cannot expect to have all the expertise in. Take cognitive science, which runs from engineering and computers to neuro-sciences of the brain. The likelihood that one country of European size will have all the expertise in the sub-disciplines of that one subject is very small. Therefore, there is benefit from interacting with those other disciplines across Europe. This was the kind of thing we thought it important to develop. Indeed, cognitive science was one of the topics. It was agreed there were a number of issues of that kind that the Councils would like to formulate. We invited Fasella and his senior assistant to the UK. There was a meeting in the DES where we put our views to Fasella. It was not a formal body. Nevertheless, we had an input to the discussion. After that of course it leaves us. There is the body which is an advisory body to the Director General of DG XII. CODEST, the Committee for the European Development of Science and Technology, and they can and do consult.

187. Who is represented on that committee?

(*Professor Mitchell*) From the UK at present it is Sir Peter Swinnerton-Dyer, Sir David Phillips and Sir Charles Reece. They are people who know the UK system, who have served in the Research Council system. One problem with that, I think, is that the kind of task one is then anticipating has too be done is too much for that committee. I do not know how it could cope without some formal support. When CODEST is having a meeting to discuss some of these things the Councils give a brief unofficially to the UK representatives. I know the CNRS do that with theirs and that the Germans do also. There are then routes through but I do not think they will be adequate for an expanded programme. The results in a number of programmes—perhaps I can submit a supplementary statement about this—(Esprit we have talked about), in the SCIENCE Programme and in the Large Facilities Programme have not been too bad for the UK. We are getting frequently a 20 per cent return. Although one makes these points about the somewhat unsatisfactory nature of the process, nevertheless we are getting our share, and more than. The way the Commission formulates its programme is a result of interaction and we feel it could be just a little more systematic about it.

Lord Lloyd of Kilgerran

188. I should like to revert to your paper. You were asked, "Should the Commission give emphasis when supporting particular projects to those which strengthen the economic and social cohesion of the Community and which encourage the role of small and medium sized enterprises? If so, can this be done without sacrificing the level of excellence of programmes". I take the view that is an important factor, and should not the next Framework have more regard to that? You mentioned Eureka. It seems that Eureka is drying up, so I am told, at present. Should not the EC take over some kind

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of concern, something like Eureka? Have you any ideas of how small and medium sized firms can be encouraged to participate in specific projects?

(*Professor Mitchell*) There are two parts to the question. One relates to economic and social cohesion, the other to small and medium companies that can both be seen as part of that cohesion and looked at separately. Taking the second first, the small and medium enterprises must be brought into the Framework Programme. I was going to say that it is more important than the large ones. The large ones on the whole have their interactions anyhow. A small or medium enterprise acting alone perhaps is not going to have the research capability, or the enabling technologies or the precompetitive work and given the speed with which the fields move. I should have thought it vital that that be done not only in the UK but on a European basis. On the first part, although I said the Commission's driving force and rationale underlined the competitiveness of European industry, they also slip in other statements that are perfectly sensible in themselves and I have no objection to them—for instance, the social cohesion of Europe. Often that means they make sure there is a fair treatment and bright people are encouraged from the southern European countries—Greece, Portugal and so on. That is marvellous stuff and I have no objection. However, we think if that is so there should be a part of the fund which is social cohesion. Social cohesion might be helped in a number of fields—science, sport and so on. We should not be diverting the science vote away from excellence in science and technology into that purpose. We should be by all means achieve that purpose, but it should be recognised that there are funds to achieve that. We would all hope that having a competitive industry would help to ensure the cohesion. We do not think we should be in the position of having a system that says, "Esprit or biotechnology, fine", and deduct a bit from the excellent programmes to give it to cohesion. If there is a real thought about that we believe it should be separately funded.

189. Thank you. In my question I was only concerned about how to assist small and medium sized enterprises by particular projects. You are in favour of that?

(*Professor Mitchell*) Yes.

Chairman

190. How do you get it done before the big boys muscle in and the small companies have a chance to move?

(*Professor Mitchell*) We are of course talking about the precompetitive research, and that has got to be done by associations or clubs of people interested from those companies in a particular field. We do that a little in this country, not only in SERC but in other parts. A lot of companies—small ones—in biotechnology will join for a fee.

191. So you have taken the initiative in creating what you call these clubs?

(*Professor Mitchell*) Not uniquely so. We and

others have clubs. Harwell has some clubs on combustion processes. I think the route in for the small and medium enterprises is of that kind.

Earl of Lauderdale

192. May I come back to something Professor Mitchell said at the beginning about the SERC relationship with CERN and the European Space Agency. In one paper with which we have been supplied we are told that British involvement would not be appropriate in the thrust of major facilities in big science or for particle physics or astronomy. How do you see the present JET programme and the future NET programme in relation to the Framework Programme? Have they any relationship to one another?

(*Professor Mitchell*) Perhaps I may come to that with a general comment first. In SERC we do not feel that the only form of scientific and technological collaboration in the sort of things with which we are concerned in Europe should exclusively be via the EC; there are other routes. We are for example discussing with the French, Italians and Germans a particular laser for civil research—nothing to do with fusion—and we think that is perfectly acceptable and a sensible way to proceed. If we decide to go ahead with it and manage it we would hope that the EC would help other countries to use it. That is a starting point. In relation to JET, SERC as an organisation I do not think has a view specifically. What I say is more of a personal statement, I suppose. My background is one of experimental physics. It seems to me important that work of that kind—fusion—should go on on a European scale, at least, just at the moment, and we should not justify that specifically by saying it is going to produce a new energy source by a certain date. It has the potential for that ultimately but it has to be seen as a piece of research.

193. But not organically related to the Framework Programme?

(*Professor Mitchell*) The fusion programme is in the Framework Programme so JET is in the Framework Programme, I am advised.

194. But you do not really think the Framework Programme should be involved in providing big facilities?

(*Professor Mitchell*) I do not necessarily think that. I do not think they necessarily have to provide all big facilities. In this case it is strategic science in the sense that we define it, it is potentially applicable in the medium/long term, and I think the only way of doing JET is by that kind of collaborative regime. I see the comparison you are making now—I am sorry I have been a bit slow! A thing like JET has to be done on a European basis, I think, and the history of that subject is such that it is sensible it should continue being done in the EC.

195. Would you say the same about the fast reactor?

(*Professor Mitchell*) The fast reactor is further down the line of producing power. That is much more in an almost constructional stage as a generator

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[Continued]

[Earl of Lauderdale *Contd*]

of power. The issues there become almost the financial ones of power production.

Lord Ironside

196. May I return to the Esprit programme. Who is taking the intellectual lead in IT advances? Is this coming from HEIs or from industry, which of course is highly involved in the Alvey programme, or what is left of it, and Esprit too? One is thinking of the spin off to the university field and then on down into the national curriculum where people are getting taught about the new intellects developing because of the advances in IT. Industry has to recruit people. If they are making the advances themselves and taking the lead, they like to see that young people are being taught in the right intellectual manner concerning all the IT advances.

(*Dr Worsnip*) There are two elements to the Esprit programme. There is what I like to call the mainstream programme which is industry-led. Then there is associated with that programme Basic Research Actions. Those actions do not require industry participation. They are solely academic collaborations across the frontiers in Europe. There is therefore a spectrum of research going on within Esprit starting at the academic end in basic research actions and leading on to academic participation in the industry-led projects. May I perhaps return to a point that was made earlier. I think you said universities cannot sell themselves. I would not agree with it.

197. They are getting much better at it.

(*Dr Worsnip*) Much better at it. I do not think there is an HEI in the country now that has not got an industrial liaison office. Many of those offices act as the focal point for contact with Europe so the two go together. The universities are in touch with industry through those operations.

198. I am very happy to hear it.

(*Dr Worsnip*) Secondly—this is the advice I always give to academics who are going into Europe—collaborate with the industry because the one thing you have not got (though you may be able to sell yourself) is the ability to exploit; the industry has. If you go in with a UK company at least there is the possibility of some return to the UK. It is dangerous for academics to go into Europe on their own.

Lord Ironside] I am very glad to hear you say that.

Baroness Llewelyn-Davies of Hastoe

199. You also think the Esprit evaluation attitude is really the best one going, do you?

(*Dr Worsnip*) I have been very closely involved with it and I think it is well organised, yes.

Chairman

200. I have one last question. We have been concentrating very much upon the Community. We have had evidence that the Commission itself has

been involved in projects including the Soviet Union, the United States and perhaps Japan. How do you see future exchanges and co-operation, between Community nationals with Japan, America and, perhaps more interestingly, the countries of Eastern Europe, which will clearly open up with their great seats of learning? How do we approach the next decade?

(*Professor Mitchell*) It has certainly changed the situation, my Lord Chairman. I would not like to talk about two decades specifically. Let me answer first by referring to the SCIENCE Programme. We have to think not only in relation to the EC, but there are other countries in Europe apart from the Eastern European ones—the Austrians, the Swiss and so on. In the Mobility programme in Line six, in the EC I believe the thought about exchanges, interactions and so on and the SCIENCE Programme should not be confined to EC countries. I do not mean that in a sense of disposing largesse in any way, but I think it is to our benefit that we have exchanges with bright people in Switzerland or whatever. I suppose here I should declare not a financial interest but I am a Vice-President of the European Science Foundation, which is an organisation including ourselves and the CNRS, the funding agencies and learned societies across Europe. I believe the Commission could and should take full value of that because it includes all Europe and at present is having discussions with countries like Poland, Hungary and so on. I believe the Commission could work through, in terms of these exchanges, the European Science Foundation. There are observers from Eastern Europe and there were at the Foundation's assembly in Strasbourg last November. I think the ESF operates with a much lighter touch and it relates back to the member organisations such as UK Research Councils. We could, for example, relate such people as were chosen for exchange fellowships to choices that we are making ourselves nationally. It would help close the gap to which we referred at the beginning. That is in the science area. In the precompetitive research areas we have to take the view, in relation to the EC and to extending to other countries, of looking at it as a challenge to European and UK industry. The data of the research accessible—the point I made before—are enormously enhanced. If one goes outside the Commission we have discussed with Japan and the United States the possibilities. My belief is that the key thing is to get the intellectual property rights agreements properly done, but one should not be afraid of going into things because Japan might cream this or that off. We say this also to universities that are involved. We have recently had a case that does not concern the EC but was in an institution we set up, an interdisciplinary research centre at Cambridge, into which the Japanese put money. There was a terrible outcry about this IRC that SERC had started having relations with the Japanese. Our argument is that if people judge that is right for the science the key thing is that they must have a cast iron agreement about the intellectual property rights. I would extend that view to these other interactions. I believe the Framework Pro-

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[Chairman Contd]

gramme in 20 years' time that our successors will be discussing will look quite different. It will involve more of Europe. I hope it will involve the Eastern European countries in some way. I am not necessarily saying there has to be a formal membership, but in terms of the intellectual possibilities one does not want to shut oneself off from that source of knowledge.

Lord Lloyd of Kilgerran

201. If anyone mentions intellectual property rights it is inevitable that I must ask a question, particularly when a person of the status of Professor Mitchell talks about a "cast-iron agreement" in relation to intellectual property! I am very happy to know that he is giving advice on this matter. Could he show the committee one of these intellectual property agreements?

(*Professor Mitchell*) What I had in mind, my Lord

Chairman, is that I would consult the noble Lord before reaching an agreement!

Chairman

202. Professor Mitchell, may I thank you and your colleagues very much for coming this morning and for the way in which you have spoken to the Committee and answered questions. If in the course of our writing the report we have one or two other matters, perhaps we may come back to you. You have already agreed to send us a number of notes. We are most appreciative of everything that you have done for us today.

(*Professor Mitchell*) Thank you for inviting me and listening to me, my Lord Chairman. I have enjoyed the discussion. If there is any further help we can give, we will be delighted to do so. I have been doing a lot of speaking from our side, but I would like to thank my colleagues, who have been providing me with an enormous amount of material. I could not have done it otherwise.

Supplementary Memorandum from SERC

As promised during my recent appearance before the Select Committee, I enclose more detailed information regarding the ESPRIT programme in particular, and statistical data relating to the success of UK participation in the EC SCIENCE Plan and the Large Facilities Programme.

European collaboration is of benefit to the UK in a number of ways, notably in enhancing the scientific and technological base through the use of additional expertise not readily available within the UK, and thereby ultimately enhancing the economic and industrial base of the UK.

The increase of benefit to the European Information Technology industry is demonstrated in the increase of cross border alliances between information technology companies in 1983 and 1987. This is illustrated in the following table:

	1983	1987	Percent increase
Inter-Europe	6	61	916
Europe-Japan	8	12	50
Europe-USA	32	60	87
USA-Japan	9	29	222

One of the major aims of ESPRIT is the promotion of European industrial co-operation in precompetitive research and development in information technology. One success of the UK in this field can be illustrated by the SUPERNODE results achieved in the first phase of ESPRIT, on the development of high performance/low cost parallel architecture computers which will be enhanced in ESPRIT II, and other examples of UK success are included at Annex A. Following the SUPERNODE results a comprehensive extension will be made to the range of European minisupercomputers developed in ESPRIT I which are now being built and marketed by one French and one UK company.

With regard to the EC SCIENCE Plan (see Annex B) the programme meets a need for international collaborative research projects to be funded from one source rather than several disparate funding agencies. UK researchers supported under the programme have commented that the funding has been essential for the success of their projects in bringing together scientists within Europe who would otherwise have worked alone.

As a result of the EC Large Facilities Programme (see Annex C) the UK has received support for the enhancement of the Synchrotron Radiation Source (SRS) at SERC Daresbury Laboratory and enhancement of the Muon Facility on ISIS (spallation neutron source) at SERC Rutherford Appleton Laboratory, with an agreement to promote access to these facilities by researchers from other EC Member States. The aim of the programme is to provide funds to contribute to the running costs and some enhancements of major facilities in exchange for time made available to scientists from other EC Member States who would not normally have access to them.

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This form of support increases the benefit of the UK science base by enhancing multilateral collaboration which might not otherwise occur since the extensions were not at the top of the UK national priority in those fields and allows access by researchers from other countries who might otherwise make use of facilities in, for example, the USA. The enhancement of these facilities would not have been possible without the EC funding. The UK has received approximately £3,242k from the EC in support of these facilities (SRS = £1,500k; Muon Facility = £1,742k).

I understand that you have circulated the amended transcript of my evidence to the Committee and that you will be forwarding a copy of the full transcript to SERC in due course.

E W J Mitchell
26 March 1990

ANNEX A

ESPRIT SUMMARY

(Cost in million ecu)

	<i>Total projects/ total costs/CC</i>	<i>UK participation in projects/cost of projects/CC</i>	<i>UK share of CC</i>	<i>UK HEI share</i>
ESPRIT I	227/1500/750	157/1068/534	146.00	17.40
ESPRIT II (1st Call)	156/1630/815	122/1302/651	162.00	38.60
BRA's	74/63/63	59/51.8/51.8	19.50	16.50
VLSI design skills	115/12.5/12.5	38/1.7/1.7	1.70	1.70
Parallel computing	55/3.3/3.3	8/0.48/0.48	0.48	0.48
Microelectronics	25/212/106	11/66.2/33.1	19.00	2.80
Total	652/3421/1749.8	395/2490/1272	349.00	77.50

Note:

CC = Community Contribution.

Summary:

UK share is 20 per cent of CC for total projects;

UK HEI share is 4.5 per cent of CC for total projects and 22 per cent of UK share;

UK has access to research results in 395 projects costing a total of 2,490 million ecu with a CC of 1,272 million ecu.

ESPRIT PROGRAMME HIGHLIGHTS

ADVANCED MICROELECTRONICS (MEL)

The Computer-Aided Design (CAD) tools and the manufacturing processes developed in the Advanced Microelectronics area of ESPRIT are increasingly finding their way into industrial fabrication plants. These advanced tools and processes allow the smallest feature on the circuits to be reduced to less than one micron, thereby permitting circuits with more than one million transistors to be put on a single chip. The microelectronic ESPRIT projects are also extending the scope of the tools and the applicability of the manufacturing and testing techniques to allow a wider variety of circuits. This will result in chips for products in the consumer, computer and communications fields which are both more flexible and cheaper.

In the CAD area, 1988 saw the emergence of a consensus on standards for the exchange of design data. Significant results from CAD research projects have also been achieved. For example, the CATHEDRAL design system for digital signal processing circuits was improved and applied in the design of chips employed in digital colour video filter circuits and compact disc audio players. The SPIRIT CAD system, produced by ICD from developments in ESPRIT Project 991, won prizes in the USA for production of the most compact layouts, which implies the cheapest cost. This system is used by Philips and is sold by ICD running on a workstation made by PCS, the other partner in the project.

ESPRIT's achievements in CAD also extend to circuits in the gallium arsenide (GaAs) compound semiconductor material. A package produced by ArguMens is available on a variety of computer workstations and out-performs other commercially available software packages. Projects designed to cut down the cost of testing fabricated chips include the use of the revolutionary technique known as Built-In Self-Test (BIST), where circuits to test the device are included on the chip itself. During 1988 ICL completed the design of their first commercial circuit using BIST, and thereby hope to greatly reduce their dependency on expensive external test equipment.

More demonstrator chips have been produced in the three major process technologies of complementary metal oxide semiconductor (CMOS), bipolar silicon, and mixed CMOS and bipolar (BICMOS). The SPECTRE project for CMOS is preparing for a 0.7 micron feature size process in 1989 and intends to fabricate circuits in five locations. Demonstrators produced by the sub-micron Bipolar II project led to

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further gate array families for Siemens' internal use and for commercial customers. Pilot runs on a 90 million ecu line led to full production of 1 micron scale static memory chips by the end of 1988.

A full range of multipliers, dividers and analog/digital converters have been produced in gallium-arsenide, which is an ideal semiconductor for high-speed applications and consumes little power. A wide range of circuit-making processes in GaAs is being tackled and the demonstration chips are performing to the best world standards.

INFORMATION PROCESSING SYSTEMS

Knowledge Engineering

On the basis of ESB, Project 96, the Expert System Builder for Knowledge-Based Systems Development has been created. By the end of the project in September 1988, the Danish company Søren T Lyngsøe had announced the commercial release of two products based on the results of this project, THOR and ODIN, for the automatic creation of power-plant applications. In addition Plessey is using this system internally, the TECSIEL has announced the commercialisation of their system builder on a range of machines. In other projects, basic tools have been developed both for knowledge acquisition and the creation of Knowledge-Based Systems, and the success of the demonstrators has assisted the transfer of this technology to industry.

In the Supernode project, work by THORN-EMI, RSRE, INMOS, TELMAT, APSIS and the Universities of Grenoble and Southampton has brought to the market a low-cost high performance multiprocessor system which provides the best price/performance ratio among minisupercomputers, leading to the two T.NODE and PARSYS 1000 commercial product lines. Other systems will be commercialised based on the T800 floating point transputer which was also developed in the same project; 10,000 T800s are sold each month, many of them in Japan. The success of this project led to the decision by Thorn EMI to launch the new start-up PARSYS.

Interfaces

The hardware and software for a system for speech and image recognition and understanding has been developed in SIP, Project 26. The speech system has been developed to understand spoken sentences at a speed close to real time and will allow the on-line spoken interrogation of databases. The image processing system will be of great benefit in, for example, automated manufacturing systems by allowing robots on an assembly line to recognise components. The systems were demonstrated at the ESPRIT '88 Conference.

OFFICE SYSTEMS (OS)

It has been evident for some time that employment is moving from factory to office and that competitiveness depends on efficient office systems. The design of the office of the future is becoming clearer; it will use electronic means to replace gradually paper communication with electronic document communication. The diversity of computer installations complicates this objective. Key tasks in the office systems area are to ease the way humans deal with computer workstations, and to ensure simple and secure communications between different makes of computer equipment.

At the heart of the strategy is a multimedia office document architecture (ODA), which, it is hoped, will be adopted by the major equipment manufacturers and assist software producers. In 1988 the ODA standard gained wider acceptance within ESPRIT projects and within the industry. This format and method of sending documents has been adopted by the European Computer Manufacturers' Association (ECMA) and by the International Standards Organisation (ISO), and it is included in the CCITT T.400 series of recommendations. ODA-based word processors and desktop publishing systems are expected on the market by 1990. Another project is fitting voice into the standard ODA framework.

New office products which go beyond traditional terminals, printers and facsimile transmission are also being developed. A large-scale display panel with computerised control of up to 251 individual panels was tried out in 1988. Coding of picture signals may lead to an international standard for digital-ISDN-telecom transmissions. Prototype workstations are also demonstrating advanced methods for handling text, picture and graphics and also for filing them. They can also decipher handwritten information and accept spoken instructions. Bull and AEG are two partners considering marketing such products.

It is important to be able to read paper documents directly into machine-understandable code for display on a screen and for storage or manipulation. One achievement within ESPRIT is a high-resolution colour scanner which can be connected to a workstation. Colour documents and reproduction by printers are tackled by another project which expects industrial results by 1990.

Shifting large volumes of data—text, pictures, graphics and eventually voice messages—efficiently is a large part of the ESPRIT office systems area. Projects on local area networks, linking the terminals in an office building, are leading to new methods which can handle larger volumes. Optical fibres and packet switching at 140 megabits/second have been demonstrated with gateways to lower volume ISDN networks

and satellites. A videoconference in 1988 between Liège and Antwerp, in Belgium, proved the technology and specifications developed by the project partners. Optical fibre links within a metropolitan area have also been tested.

COMPUTER-INTEGRATED MANUFACTURING (CIM)

The benefits of the standards and technologies developed in the CIM area of ESPRIT were proved in working factory demonstrations during 1988. The setting of international communication protocols and interfaces within the open systems interconnection model enabled equipment from a series of major hardware makers to be linked together, and these systems were demonstrated publicly during 1988. Projects in the other three major areas of CIM are also influencing product development. This is clearly the case in the niche markets of design, graphics and engineering, in robotics and in manufacturing planning and control.

The 19 organisations in the AMICE project on open systems architecture turned their 1987 key concepts publication into a working demonstration of the CIM-OSA philosophy in 1988. The Communications Network for Manufacturing Applications (CNMA) project continued to promote its standards, which are compatible with the Manufacturing Automation and Technical Office Protocols (MAP and TOP). CNMA outshone these two US multi-vendor environments with its production demonstration at the Enterprise Networking Event '88 in Baltimore, US. It was also applied in 1988 in BMW, British Aerospace and Aeritalia factories.

Interfaces with equipment in other stages of the manufacturing process have been developed in the areas of Computer-Aided Design (CAD) and Computer-Aided Engineering (CAE). A CAD data exchange standard is close to international acceptance. Software tools for quicker production of CAD software and improvements to the way operators deal with their terminals are leading to redesigns of industrial products already on the market. Demonstrators of computer-aided lathe controllers with enhanced graphics have been installed at two plants in the UK with a third site at Bremen University ready for further experiments.

ANNEX B

EC SCIENCE PLAN EVALUATION PANEL

(1) *The size and balance of components and support mechanisms of the programme*

The Division of funds between the three mechanisms (Research Grants, Twinings, Operations) available and the criteria for support appears reasonable. The Twinning element is that which is in greatest demand and it is therefore appropriate that it receive 50 per cent of the programme budget. Attention is paid to the quality and timeliness of the proposed research rather than political judgments—such as topical areas or involvement of certain Member States. The possibility of progression from one strand of support under the programme to another, in the form of further contracts, as projects develop is very useful. It is satisfying to see the opportunities available for young European researchers. The programme is useful in that it has no specified closing dates and researchers are therefore able to work up applications at their own speed, rather than rushing proposals to meet deadlines. The lack of minimum and maximum amounts of funds available is also seen as useful to researchers. The programme is aimed at, and fulfils, the criteria of supporting both basic and applied science at a multinational, and often interdisciplinary, level, thus ensuring a gradual breakdown of barriers between scientific disciplines and groups of researchers in separate Member States.

A common and growing problem is the reduction at the contract negotiation stage of the level of funding for supported proposals. It is becoming usual for proposals to have a uniform 60 per cent reduction levied on them in the awarded contract rather than the 100 per cent applied for which is normally felt reasonable by the referees. It appears that this is not a reduction made solely due to the applicant overestimating the amount needed to undertake the research as perceived by the peer review system (ie referees) but a mechanism the Commission invokes in order to support a higher number of proposals. It would be preferable for CODEST/the Commission to take a decision to support the best proposals at a level of funding adequate to undertake the research proposed as is done by the UK Research Councils. It is understood that due to a reduced level of funding some researchers have undertaken only part of the proposal which was refereed as top quality. This can lead to a situation whereby one set of proposals is agreed by referees and CODEST and a different set of projects are actually undertaken.

(2) *The relationship with national programmes*

It would be difficult to assess this relationship as the programme covers all areas of science and hence is not applicable to any one Research Council let alone a specific programme. We are not aware that it has had any influence upon the direction of SERC supported programmes. There has been no known adaptation of a national programme to complement SCIENCE in the way that IT in the UK had been adapted to complement ESPRIT. We would expect this programme to support basic and applied research

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on a multilateral scale and that it should attempt to bring about a breakdown of barriers between scientific disciplines.

(3) Influence on national priorities for research, for example on large research instruments or on the size of national programmes

The programme has no direct influence upon SERC supported UK national programmes and probably little indirect influence. Neither has it had influence upon SERC's national priorities for the development or support of large research instruments although support was provided for the Muon Facility on ISIS at the Rutherford Appleton Laboratory.

(4) Examples of national research initiatives inspired by the programme

No SERC-supported national initiatives are known to have been inspired as a result of this programme.

(5) Examples of national research needs met by participation in the programme, rather than by national resources

SERC has no knowledge of national research needs having been met by participation in this programme rather than by national resources. Rather the programme meets a need of international collaborative research projects to be funded from one source rather than several disparate funding agencies.

(6) Comparison of the success of the projects compared to those of national programmes and centres of excellence

SERC does not have the information necessary to make such comparisons. We do not have access to either interim or final reports for projects supported under this programme and hence are not in a position to judge their success or make comparison with nationally funded projects.

(7) Applicants' needs for advice and help

There is definite demand from prospective applicants for advice on which avenue of support to aim for and what is allowable under the conditions of the programme. Frequently proposers require basic assistance regarding how to complete the application form, and it can be psychologically beneficial for them to have a contact within the UK whom they may approach for assistance rather than having to approach the Commission direct. Once they have established contact with a UK person they are usually happy to accept the advice to approach Commission officials direct.

(8) Requirements of "subsidiarity" and other criteria for community support

The programme should not and does not duplicate national R&D programmes and therefore fulfils the criterion of subsidiarity. It does not overlap with any specific SERC programmes.

(9) The selection procedure

The criteria for support are appropriate as is the peer review system employed by the Commission (four referees being approached per proposal). As demand continues to increase, it may be more appropriate to have subject committees established to consider the proposals from different areas. The constitutional position of such panels will depend on what new management arrangements are made for programmes to succeed SCIENCE under the new Framework Programme.

(10) The function of CODEST

The operation of CODEST has been appropriate to date, however with the increasing number of proposals being submitted in widely differing areas of science, it may be more appropriate for a Management Committee to be established with several subject committees under its jurisdiction. This would also serve to bring the management of the programme into line with the management of other EC R&D programmes. The role of CODEST could become increasingly ambiguous if it remains unaltered.

(11) The rejection rate

The success ratio is on average 1:7, this is not unreasonable when taken in comparison with nationally funded programmes.

(12) Relationship with other EC programmes

It is understood that the SCIENCE secretariat consults the secretariats of other EC programmes to ascertain whether it may be more appropriate for certain applications to be considered under that programme rather than SCIENCE. If this is the case they are able to advise the proposer to request that the proposal be transferred to the appropriate unit in the Commission. Proposals funded under SCIENCE as Twinings are occasionally used as "spring boards" for larger applications to more applied programmes such as ESPRIT and BRITE/EURAM, and this is a useful development.

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(13) *Future priorities of SCIENCE*

To maintain funding of top calibre proposals. The criteria for support should be adhered to and priority should not be given to individual areas or particular Member States. Although it is reasonable for special initiatives to be operated under SCIENCE (ie on the lines of BRAIN and superconductivity) it is debatable whether specific funds should be set aside for such activities. It is appropriate that the initiatives continue in their present form, with all proposals being peer reviewed with those in other areas, and without separate budgets being identified.

Alison Bowen
9 January 1990

COMMENTS FROM UK RESEARCHERS

Dr Gelletly, Daresbury Laboratory—ESSA 30 (Funded Twinning) + Several Future Twinning Proposals

1. *ESSA 30.* The support received was essential for the success of the project. It allowed Daresbury Laboratory to bring together scientists and their equipment from eight countries, and from a number of institutions in each country, to carry out experiments at Daresbury. This would not have been possible without the extra funding since money for travel is often the most difficult to obtain. The extra dimension involved was invaluable in terms of information exchanged. The scientists concerned have continued to collaborate and they are now actively engaged in discussions of future facilities for Gamma-ray spectroscopy in Europe. No real problems were encountered other than the amount of time devoted to assembling the information for and writing the 6-monthly reports. The report timescale is too short.

2. Advice on the preparation of future proposals has been provided by SERC International Section, UK Research Councils' European Office (Brussels Office) and the European Commission. The first two have been very useful in providing information, mainly in the form of "Do's and Don'ts". The Brussels Office is important in terms of supplying the detailed information needed if one is to approach commission officials informally for advice. The Commission was extremely helpful in preparing the present set of proposals, they have been willing to interact with Daresbury and seem flexible in their approach. It is not yet possible to comment on the effectiveness of the advice as the proposals remain in the planning stage.

3. A criticism of the European Commission is that the divisions between programmes are not transparent. It is not obvious where one should be applying and interaction with the Commission is essential. They also seem to lack information and expertise to deal with some areas. CODEST is heavily laden with eminent scientists and there is a clear danger that the people determining national policy are our representatives and that they reinforce national policies in their votes at CODEST. Fresh minds might do better.

Professor Poliakov (Nottingham University)—Two Funded Twinning

4. *Twinning A.* This was an extremely successful project involving three laboratories and resulted in 23 publications over the two year period of the contract. There was frequent exchange of information and the EC funding aided the researchers in obtaining substantial additional funds from national and international sources. Much of the work currently being undertaken within the participating laboratories would not have started without support from SCIENCE and support is expressed for the programme by all the participants.

5. *Twinning B.* The first Twinning has been followed with a greatly expanded Twinning involving five laboratories. The project is already producing important results and has created an effective group involving 12 senior scientists in three EC Member States with far more equipment and facilities than would be available within a single institution.

6. Collaboration had continued between the groups for 10 months between the end of the first contract and the start of the second.

7. Advice was received from the European Commission (Mr C White, DG XII/H) during the submission of the proposals; however no advice was received from UK sources. However contact has subsequently been established with the Research Councils' European Office staff who have been of assistance.

8. The principle complaint is over the mechanics of negotiating a contract once a project has been approved. The contract procedure is painfully slow and makes it extremely difficult to manage a large Twinning project effectively. It is particularly hard to contact the administrative staff in Brussels. There is no adequate arrangement for leaving messages when staff are out and it is almost impossible to find out when particular members of staff will be in the office. It should be stressed however that when staff were eventually contacted they were usually most helpful and friendly.

9. Delays in starting the contracts can play havoc with the recruitment of staff, particularly in the appointment of postdoctoral workers. In addition, the researchers encountered difficulties with the second contract as the financial rules of the Twinning scheme appeared to alter between the submission of the proposal and its final approval. Overall, it would be preferable if applicants could be given definite dates

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[Continued

for the various stages of the administrative procedure because then projects could be planned in a reasonably rational manner.

Professor Wallace (Edinburgh University)—Two Funded Twinnings and Involvement in the BRAIN Initiative

10. The benefit of the first Twinning has been substantial in bringing together the best people in Europe in its area to exchange ideas and stimulate the researchers further. The Twinning works because it is not run rigidly. There does seem to be an element of bureaucracy in getting things started but once underway it is a valuable and flexible source of modest funding.

11. Little advice was sought by the UK participants however the Commission (Mr C White, DG XII/H) was helpful on the occasions that he was approached.

12. It would be considered particularly valuable if there was a framework in the SCIENCE Plan which facilitated complementary funding from the Commission to give an international dimension to projects which are largely based in one country. A general concern is also voiced about the level of benefit to prospective applicants from inside track information.

Dr Robert Bingham (SERC Rutherford Appleton Laboratory)—One Funded Twinning and One Funded Research Grant

13. *Twinning Contract.* This is undertaken in collaboration with the University of Naples and has proved most fruitful since both teams complement each other. The level of funding is ample to allow the teams to interact as one unit. The idea of bringing in other European groups means that RAL can do far more research for virtually the same expenditure.

14. If this trend continues, and it should be encouraged, Dr Bingham believes that Europe will once again become the centre for most scientific discoveries, example being CERN and JET where European collaboration is vital. European countries are too small on their own to compete with the USA on all areas of science, only by combining resources can Europe compete successfully.

16. The Twinning project has been very easy to manage with the minimum of interference from the Commission.

17. No advice or assistance was received in the proposal planning stage either from the European Commission or SERC. The forms seemed to be very straightforward to fill in, especially the Twinning and Research Grant forms. Anyone with experience of completing research grant applications should find the forms self explanatory. Generally any questions, after the awarding of the contract, were dealt with by phoning the Commission.

18. Assistance is to be sought from SERC International Section for a future Operations proposal.

STATISTICS—UK INVOLVEMENT IN THE EC SCIENCE PLAN

1988

Total number of proposals submitted = 448

Total number supported = 114

UK involvement in supported proposals = 72

Total number of laboratories involved in submitted proposals = 1,537

Number of UK laboratories involved in submitted proposals = 359

Total number of laboratories involved in funded proposals = 452

Number of UK laboratories involved in funded proposals = 103

UK acceptance rate = 29 per cent

Country	Number of funded proposals in which the Member State is involved
UK	72
France	69
FRG	47
Italy	34
Spain	24
Netherlands	21
Belgium	18
Eire	13
Denmark	13
Portugal	9
Greece	6
Luxembourg	0
EFTA countries	1

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[Continued]

Country Involvement in Funded Proposals by Individual Areas of Science—1988

<i>Country</i>	<i>Maths/IT</i>	<i>Physics</i>	<i>Chemistry</i>	<i>Biocom- munication</i>	<i>Earth/Ocean Sciences</i>
UK	7	21	12	15	8
France	4	20	12	16	6
FRG	4	14	10	11	5
Italy	1	10	7	4	4
Spain	1	7	7	4	3
Netherlands	1	4	4	5	4
Belgium	0	7	0	6	2
Eire	1	8	1	2	1
Denmark	2	1	1	2	4
Portugal	0	5	1	1	0
Greece	0	2	0	1	1
Luxembourg	0	0	0	0	0
EFTA	0	0	0	0	1

<i>Country</i>	<i>Scientific instrumentation</i>	<i>Engineering</i>	<i>Neurobiology</i>
UK	0	4	5
France	2	3	6
FRG	0	0	3
Italy	0	2	6
Spain	0	1	1
Netherlands	1	1	0
Belgium	1	1	1
Eire	0	0	0
Denmark	0	2	1
Portugal	0	1	1
Greece	0	1	1
Luxembourg	0	0	0
EFTA	0	0	0

1989

Total number of proposals submitted = 563

Total number of proposals funded = 111

Total number of laboratories involved in submitted proposals = 2,194

Total number of laboratories involved in funded proposals = 534

Number of UK laboratories involved in submitted proposals = 412

Number of UK laboratories involved in funded proposals = 105

Acceptance rate by area of science (general headings used)

Mathematics—20 per cent

Physics—26.6 per cent

Chemistry—16.3 per cent

Life Sciences—20 per cent

Earth Sciences—19.6 per cent

Scientific Instrumentation—13.8 per cent

Engineering—6.3 per cent

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[Continued

ANNEX C

EC LARGE FACILITIES PROGRAMME

STATISTICS

1989

Seventy-eight proposals were submitted out of which 13 received support.

Country	Number of proposals submitted	Number of proposals supported
UK	20	2
Germany	16	2
France	15	3
Denmark	6	0
Belgium	6	1
Netherlands	5	2
Portugal	5	1
Spain	3	1
Greece	1	1
Italy	1	0
Ireland	0	0
Luxembourg	0	0

1990

Eighty-six proposals were submitted of which seven proposals have been preselected. The final decision will not be taken until late 1990.

Country	Number of proposals preselected
Italy	3
France	1
Germany	1
Denmark	1
Ireland	1

THURSDAY 26 APRIL 1990

Present:

Butterworth, L.	Portland, D.
Gorell, L.	Renwick, L.
Hanworth, V.	Serota, B.
Ironside, L.	Shepherd, L. (Chairman)
Llewelyn-Davies of Hastoe, B.	Sherfield, L.
Lloyd of Kilgerran, L.	

Examination of witnesses

Mr M C MERCER, Assistant Secretary, EC2 Division, and Mr M CORCORAN, a Member of the Division, HM Treasury, called in and examined.

Chairman

203. Mr Mercer, Mr Corcoran, thank you very much indeed for being willing to come and to assist us in our inquiry into the research and development programmes of the Commission, in particular some of the anxieties which have arisen in earlier evidence to this Committee. We are very grateful in that respect. I do not know whether you would wish to make an opening statement?

(Mr Mercer) If the Committee would find it helpful, I think I *would* like to, largely because public expenditure control as it applies to European Community spending is a particularly complex subject which I think can give rise to confusion as to both concepts and terminology. I think, if I may say so, some such confusion is evident in the letter which the Committee has received from Dr Thompson of London University. The key point is that the Government seeks to control the public expenditure consequences of European Community spending within the same system and according to the same principles as apply to *all* other forms of public expenditure. This is quite simply because *all* public expenditure comes from the same pool of resources and represents the same burden on domestic taxpayers. The confusion I referred to earlier arises, I think, mainly because the nature of public expenditure controls broadly varies according to whether European Community receipts go to the public sector or to the private sector. As regards the public sector, the main source of receipts is the Community Structural Funds. The essential objective here is to try to ensure that such receipts do not give rise to a second-round increase in domestic public expenditure on top of the public expenditure cost of our contribution to the Community budget in the first place. What that means is that the expected level of public sector receipts is taken into account by Ministers each year when departmental programmes are set in the course of the annual Public Expenditure Survey. The fact of the receipts means provision for the departmental programmes in the survey can be set and maintained at higher levels than could otherwise be afforded. It

follows, I think, that domestic expenditure associated with EC receipts should be met from the pre-existing provision that has been established during the course of the survey. If it were *not* met from that pre-existing provision, then there would be double-counting, the receipts having been taken into account already. Turning to private sector receipts, the main source is the European Community's Research and Development Framework Programme. The United Kingdom's contribution to European Community R&D spending—that is to say, its *implicit* contribution—is about 20 per cent; it is the same as our contribution to the Community budget as a whole. As far as the R&D Framework Programme is concerned, we also get about 20 per cent of total receipts out of that programme, ie we are broadly breaking even. Given that our contribution to the programme represents public expenditure, but that the receipts go very largely to the private sector, European Community research and development spending gives rise, as far as the UK is concerned, to a significant transfer of resources from the public to the private sector; from our contribution to the budget to the receipts which the private sector gets. Or, if you like, it is a transfer of resources from domestic taxpayers to bodies such as research associations and universities. The strategic question which must therefore be addressed is how far should that transfer of resources add to planned levels of public expenditure? That is a question which again is addressed in the context of the annual Public Expenditure Survey. The fundamental principle is that departments are required to bid, and to make a case on value-for-money grounds, for any expenditure in excess of planned, predetermined levels. That principle applies to all forms of public expenditure; it is an underlying principle of public expenditure control as it is practised in this country. Contributions to European Community programmes are no exception to that principle. What it means, therefore, is that bids for additional expenditure are considered on their relative merits within overall public expenditure constraints, whether those bids stem from European expenditure or whether they stem from domestic expenditure. It is

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[Continued]

[Chairman Contd]

important to note, however, that the bids are required only to cover the United Kingdom's contribution to European Community expenditure which is *above* predetermined levels. What this means is that European Community R&D expenditure inevitably leads to substantial additional domestic public expenditure devoted to research and development. If I could take as an example the new European Community Framework Programme which was agreed a month or so ago, that programme will mean an increase of at least £250 million over the next seven to eight years in the level of public sector support for the United Kingdom's research effort. Depending on decisions by Ministers in the context of successive annual surveys, the actual increase could turn out to be rather larger than that £250 million which I have mentioned. Thank you, my Lord Chairman.

204. Thank you very much, Mr Mercer. We have ourselves identified three concepts: (i) "additionality"—whereby Member States contribute an additional sum of money to a project to match sums received from the Community; (ii) "anti-additionality"—whereby money received from Brussels is set against departmental spending levels in a way which roughly correlates the funding they receive from Brussels with a reduction in their permitted expenditure; (iii) "attribution"—the process of ascertaining where such reductions in departmental budgets will fall. Would these be correct definitions of what we have in mind?

(Mr Mercer) As far as the definition of "additionality" is concerned, I think the crucial point about additionality is to determine whether and to what extent expenditure stemming from the European Community budget *does* generate additional public expenditure in the United Kingdom. There are two strands to that. The first is whether or not there is a matching contribution by some UK institution or department when a European Community receipt comes in. I think the answer there is that in the case of virtually *all* European Community receipts—all of them I think are relevant to our discussion today—there is indeed a matching contribution. The Research and Development Framework Programme, for example, operates on the basis of shared cost, in most areas, between the Community budget and organisations and institutions in Member States. So far as the Community Structural Funds are concerned, in all cases there is a matching contribution of some kind, at some level, from Member States. Those matching contributions are an inherent part of the way in which the Community schemes operate, and indeed receipts would not be triggered but for those matching contributions. So there can be no question of those matching contributions not being made and, to the extent that they represent public expenditure, not being made as part of public expenditure. There is, as I say, the broader concept, which I tried to address in my opening remarks, of the extent to which European Community receipts lead to additional public expenditure in the United Kingdom. As I have said, in the case of R&D they do indeed lead to very substantial additional public expenditure which represents a substantial addition

to the UK's publicly funded research effort; and, as far as other receipts are concerned—typically, public sector receipts—they do indeed allow public expenditure programmes to be set at higher levels than could otherwise be afforded.

205. Then is additionality a policy goal of the Commission? Is it enshrined in the Treaties or Community law? Is it a goal to which Her Majesty's Government also aspires? If so, can you provide some specific example, preferably in the field of R&D?

(Mr Mercer) Perhaps I could ask Mr Corcoran to answer those points.

(Mr Corcoran) Yes indeed, my Lord Chairman, the Community does have a policy on additionality. It is an explicit policy that is enshrined in Community legislation and arises in relation to the Structural Funds. When the current Structural Fund regime was introduced in 1988 there was a series of Regulations. One of those Regulations which co-ordinates the activities of the Structural Funds has an Article in it which describes the Community's policy on additionality. It is quite short, and if the Committee would find it helpful I could read it through.

Lord Lloyd of Kilgerran

206. Which Article is it?

(Mr Corcoran) It is Article 9 of Regulation 4253/88 of 19 December 1988. It says that "In establishing and implementing the Community support frameworks, the Commission and the Member States shall ensure that the increase in the appropriations for the funds provided for in Article 12(2) of Regulation (EEC) No. 2052/88 has a genuine additional economic impact in the regions concerned and results in at least an equivalent increase in the total volume of official or similar (Community and national) structural aid in the Member State concerned, taking into account the macro-economic circumstances in which the funding takes place." That Regulation was adopted unanimously.

Lord Butterworth

207. Could I just make the point here that I think this is absolutely crucial. The definition that you have given is what I always understood "additionality" to mean, and I think we ought to adopt that. A definition we have is that "additionality" means that Member States contribute an additional sum of money to a project to match sums received from the Community. I do not think that is the correct definition of "additionality". We also talk about matching sums. That is entirely different. The definition of "additionality" for today ought to be the one that you have given, I would suggest.

(Mr Corcoran) My Lord, I would agree with that.

Chairman

208. We have made progress, then!

(Mr Mercer) It was indeed that concept which I was seeking to address in my opening remarks, rather than the concept of matching contributions.

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[Continued]

Lord Butterworth

209. I realise that.

(*Mr Corcoran*) As I was saying, the Regulation itself was adopted unanimously. I think an implication of that is that the United Kingdom did agree with it, and does agree with it; and the United Kingdom spending plans are consistent with that Regulation. However, the Regulation itself concerns monies out of the Structural Funds rather than research and development. As Mr Mercer has said, the money from research and development comes largely to the private sector, and the effect of the expenditure under the Framework Programme can be characterised as partly a shift in the spending on R and D from the public to the private sector and also an overall substantial increase in spending in the UK on research and development. As far as receipts by the public sector are concerned under the Framework Programme, we would normally expect that money to be used in full and to be available in full to be spent.

Chairman

210. If my colleagues are satisfied in regard to additionality, perhaps we could move to the question of "anti-additionality" which seems to be the counter-situation. What are the origins of the principle? Can you point to a specific decision (ministerial or other) to apply it? Can you provide some examples of how it works? Is the interpretation of "anti-additionality" sensitive to the distinction between what would have been done anyway without Community funds, and the greater scale of what might be done with such funds?

(*Mr Mercer*) There is, I think, a problem here about terminology. I have to say that the concept of anti-additionality or non-additionality is not one which is immediately recognisable in terms of the way in which public expenditure is planned. It may or may not be recognisable in terms of the way in which public expenditure is accounted for. I think those are two rather different things which, if I may, I will seek to explain. Firstly, specifically in relation to the question about the origins of anti-additionality (as it is called in the question), the Government's policy as regards the control of public expenditure consequences of European spending is, as I mentioned in my opening remarks, founded on exactly the same principles as apply to public expenditure control generally. Therefore the rules governing the treatment of European Community receipts are an integral part of the Public Expenditure Survey process; they are very much on all-fours with the rules governing all other types of public expenditure. So, if you like, the straight answer to the question about the origin of the Government's rules in this area is that they have the same origins as the Government's overall policy as regards the treatment of public expenditure. On the more general point—the confusion that can arise in relation to terms like "anti-additionality" or "non-additionality"—as I mentioned in my opening remarks, if we are talking of additionality in the sense that European receipts generate additional domestic public expenditure,

additionality in that sense, as far as public sector receipts are concerned, is secured at the stage when the levels of departments' programmes are established in the annual Public Expenditure Survey. In anticipation of European Community receipts, those programmes are set and maintained at higher levels than could otherwise be afforded. So there is higher UK domestic expenditure, including expenditure on the programmes in question, as a result of European Community receipts. It is because of that that the UK was in the first instance able to subscribe to the piece of European Community legislation which Mr Corcoran read out just now, and also why we can show that we are performing in accordance with that piece of legislation. Once domestic programmes have been established at this rather higher level, because of Community receipts, it follows, I think, that when the receipts themselves actually arrive, when they come into the country—and this is where one moves from, if you like, principle to accounting practice, when those receipts come into this country—the expenditure associated with them should be met from the pre-existing provision which is established in the survey, because that pre-existing provision already takes account of the receipts (if you like, it is drawing on the receipts prematurely, before they come in). When the receipts come in, it follows that the associated expenditure should be met from within the pre-existing totals; that the receipts should be a financing item at that stage, rather than a further additional item. I think it is at that accounting stage perhaps that the concept of anti-additionality (as it is described in these questions) or non-additionality (as it might be described) could be said to be relevant. There is no further additionality at that stage, because if there were there would be double-counting.

Baroness Serota

211. Mr Mercer, at what stage are you aware of what the Community contribution is going to be, in respect of individual schemes?

(*Mr Mercer*) In respect of individual schemes, so far as the Structural Funds are concerned, again there is a distinction to be made here, I think, between the Structural Funds, predominantly public sector receipts, on the one hand, and R and D, predominantly private sector receipts, on the other hand. Certainly under the new regime governing the operation of the Structural Funds which operates through Community support agreements and partnership agreements, there is a reasonable degree of predictability as to the overall scale of United Kingdom receipts, or at least the overall scale of funds which will be allocated to the United Kingdom out of the Structural Funds, and a reasonable degree of predictability also as to the form which those receipts will take, because that is one of the elements which is agreed in the course of establishing Community support frameworks. So far as research and development is concerned, the position is slightly different, as I mentioned in my opening remarks, in that there the way public expenditure control operates, given that we are dealing with predominantly private sector receipts, is not to make adjustments

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[Continued]

[Baroness Serota *Contd*]

to departments' programmes during the course of the survey, it is to make those adjustments to departments' programmes as and when the receipts from the Framework Programme arrive in this country.

Lord Butterworth] That is the bit that I do not think I fully understand. I see how additionality applies, shall we say, to the Structural Funds, but I do not see how the accounting principle operates if, in R and D, funds are provided from a European source to a private body. How can there be this gathering back, as it were? I do not know the correct term.

Chairman] Clawback.

Lord Butterworth

212. Yes, clawback. How should that come about? The Government would not have been providing funds for that particular activity in, let us say, a company.

(Mr Mercer) In many cases I think there would have been a corresponding flow of funds from the Central Government to the organisation which is carrying out the research. If, for example, one were to take the case of a research institution which attracts European Community money, then I think I am right in saying—and I am no specialist in the way that research institutions work—that by and large one could expect that research institution also to be receiving central government funds of one kind or another.

Chairman

213. But surely it could be for other things?

(Mr Mercer) Perhaps for other things, although the extent to which there was correspondence between the nature of the European Community receipt and the nature of the grant which it would otherwise get from Central Government, the extent that they were for the same sort of work, will depend on how successful we have been in ensuring that the European Community programmes were broadly consonant with our own domestic priorities. To return to the case of the research institution, that research institution will get the full amount, of course, of its European Community receipts. There is absolutely no intervention whatever, neither could there be, as far as Central Government is concerned, in interrupting the flow of that receipt. What Central Government must then ask itself is how far that receipt and all other similar receipts should represent an absolute addition to the budgets of the research associations concerned—if you like, an absolute addition to the United Kingdom's research effort. At the extreme, it could be argued that every single penny of receipts from the European Community should represent an addition to the United Kingdom's research effort. What that would mean, as I outlined earlier, was a very, very substantial transfer of resources from the public to the private sector in this country. I also would suggest that it is an argument which is rather difficult to sustain logically, because it would be based on the proposition that there could never be any degree of substitutability as between European Community money and

domestic money. I would rather suspect that, given the way these things work, that sort of proposition would be a recipe for waste and duplication. So the principle is that there is a degree of substitutability as between domestic and European programmes, and therefore that there are adjustments in domestic programmes to some degree to take account of European receipts, but those adjustments are smaller than the European receipts. Very broadly, in the case of the new R&D Framework Programme, the adjustments in domestic programmes that will be made as a result of that programme—that is to say, the reduced flows of funds from government departments to research institutions—will be very much smaller than the receipts which the research institutions get, very, very broadly.

Lord Butterworth

214. Let me take a slightly different case. Let us take a university—you can, if you like, say a university in collaboration with a particular industry—and they are convinced of the importance of a particular piece of research. They may go to the Science and Engineering Research Council to have it funded, in which case they would have an additional grant for which no clawback procedure would exist; it would be an additional grant to undertake a particular piece of research. Instead of going to the SERC, the university and the industry decide to apply to Europe and they get the grant from Brussels. Have we any guarantee that there will be no Treasury clawback when that is received?

(Mr Mercer) There is no such thing as Treasury clawback in this sense. What would happen is that as a result of the United Kingdom's contribution towards that European receipt, which represents taxpayers' funds in exactly the same way as the grant which the research association would otherwise have got from Central Government, to the extent that the United Kingdom's contribution cannot be met from pre-existing public expenditure provision, to the extent that that contribution is above planned levels—but only to the extent that it is above planned levels—then there is an adjustment made in the domestic public expenditure programme of the relevant department.

215. This is what I do not understand, you see, because if the group concerned had gone to SERC and been successful, it would have been funded 100 per cent. I think what you are now saying is that if it goes to Europe and is successful, then at the accounting stage these accounting rules would cause future grants to be reduced by 20 per cent of the total European grant?

(Mr Mercer) No, that is not what I am saying, my Lord. What I am saying is that if you looked at the totality of receipts by universities or by research associations or whoever else in this country is getting Community money—

216. Just take my example.

(Mr Mercer) It is rather difficult, because the controls are applied at a global level as far as the Treasury is concerned.

217. I am sorry to interrupt. You mean that these

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[Continued]

[Lord Butterworth *Contd*]

accounting procedures would be applied at the SERC level? Or at what level would they be applied in my particular case?

(Mr Mercer) The rules governing the way in which public expenditure control operates apply at the global level, and it is at the global level that one is able to make statements to the effect, as I have done, that—

218. Could I know what is the global level in this case?

(Mr Mercer) Yes, the global level is the way in which the Treasury relates to departments, as concerns public expenditure control, and it is at that level that the overall adjustment in departments' programmes, which is made to compensate for European expenditure—

219. I am sorry, but I would like to know in my case where the actual adjustment is made. Is it made between the Treasury and the Department of Education, or between the Treasury and the SERC?

(Mr Mercer) I am trying to come on to that, if I may, my Lord, because there is a sort of a cascade effect here. The stage at which the controls globally are applied is in the relationship between Treasury and departments. The Treasury, if you like, contributes to the European Community budget for R&D, as for other things, and that represents additional public expenditure. The Treasury's relationship with departments is such that to the extent that additional public expenditure is mirrored, as in the case of R&D, by receipts to predominantly private sector organisations, the Treasury needs to decide with departments how far that transfer of resources, that additional public expenditure represented by the additional receipts, should itself represent an overall increase in public expenditure. The way in which the rules currently operate is that that contribution and those receipts do indeed represent an overall increase in United Kingdom public expenditure, and that overall increase, as I mentioned in relation to the R&D Framework Programme, will be something like £250 million over the next seven to eight years. What that therefore means is that there is no offsetting reduction in departments' programmes which corresponds penny for penny with the additional receipts which the UK is getting.

Chairman

220. What about the totality?

(Mr Mercer) The additional receipts are genuinely additional to the extent of at least 30 to 35 pence for every pound of those receipts; genuinely additional, in the sense that I understand the Committee to construe additionality.

Lord Butterworth

221. I think I must press you a little on this. The difficulty is, is it not, that in my case the university would get a grant from the department or from the University Funding Council, but that would be wholly for staff and plant and so on and not for research? Admitted that this grant from Brussels represents additional funds being spent in this country on research, if any deduction is made by

your accounting processes from the Department of Education, be it to their central fund or be it to the money that is provided to them for the Research Councils, this would be, so far as the research of the country is concerned, an actual reduction. Or, put it another way, you would be replacing research that would be organised by the Research Councils, and you would be reducing that in order to fund a different piece of research which had been sanctioned from Brussels.

(Mr Mercer) It was precisely to try to elaborate that point, my Lord, that I wanted to start at the global level to show that globally that proposition is not strictly correct, because the global adjustments that are made are smaller than the increased expenditure to which European research gives rise. When one comes down from the global level to the particular, there may indeed be cases—I certainly could not rule out the possibility that there *would* be cases—in which an individual research institute in receipt of European Community money found that its budget was reduced perhaps to the extent of that European Community money. At an individual level, right at the margin there *may* be some cases like that, despite the fact that the aggregate of all such cases is global additionality, additional research effort as a result of European Community funds. Now that could arise because there might, for example, be a degree of mismatch between priorities for the European Community research and established domestic priorities. It is specifically to cater for that potential mismatch that there are flexibilities written into the public expenditure proposals as they apply to European Community spending; flexibilities which ensure that such cases at the margin are considered on their relative merits within existing public expenditure constraints, against all other similar marginal cases which arise over the whole spectrum of public expenditure. That is to say, the whole thing is brought together in the annual Public Expenditure Survey where departments are free to bid and will no doubt make bids where they feel that there are particularly glaring mismatches as between the priorities adopted at European level and the priorities of domestic research institutions.

Lord Sherfield

222. We pay, roughly speaking, 20 per cent of the cost of the Framework Programme. We pay that irrespective of any receipts that we may receive in return, and that is a fixed sum each year, is that right?

(Mr Mercer) Yes.

Lord Sherfield] However, if the private sector gets some money back, there is not any additional public expenditure in the sense of the contribution which you have already made or which you make to the European Community, so that in that sense I do not see that a receipt necessarily involves an additional public expenditure over and above the 20 per cent.

Chairman

223. Could I put a supplementary to what Lord Sherfield has put to you? In the case of near-market

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[Continued]

[Chairman Contd]

research and development, my understanding is that the United Kingdom does *not* support the Community in that respect, therefore, any sums received in no way can be seen as substitution for UK funds. Would that be right?

(Mr Mercer) I think that so far as Lord Sheffield's point is concerned, it is indeed absolutely right that the receipt itself, if it flows to the private sector, does not generate additional public expenditure. The public expenditure has come about as a result of our contribution to the European Community budget. There are, if you like, two distinct public expenditure flows here. There is our contribution to the European Community budget, and there is the public expenditure represented by UK public sector support for research. The proposition which the policy rests on is that receipts which stem from our contribution to the European Community budget—predominantly private sector receipts in the case of R&D—should, in terms of scientific logic as much as public expenditure logic, to some extent substitute for public expenditure which would otherwise have been made in this country, otherwise one has the position that there can never be any degree of substitutability as between Community work and domestic work, which would in itself tend to imply that European priorities were wholly different from the domestic priorities. That is the scientific basis. The public expenditure basis is that it is considered a reasonable proposition that receipts from the Community budget, whether they flow to the private sector or whether they flow to the public sector, should have some effect—some effect—in terms of offsetting our very, very substantial gross contribution of nearly £5 billion a year to the European Community budget. Were those receipts simply to be passed through the system without any control at all, then we would be in the slightly odd situation whereby the net public expenditure effect of our membership of the European Community was the same as the gross public expenditure effect of our membership of the Community—that is to say, a contribution of nearly £5 billion a year.

Lord Butterworth

224. Does not your concept of "substitutability" pose a political problem? Many people are encouraging universities and other institutions to bid for grants in Brussels, on the ground that this will be additional funds for additional research. Indeed, in many institutions staff are chided because they are not applying with sufficient energy for these grants in Brussels. But then we have to look at your doctrine of "substitutability" or your accounting procedures, because if one were the head of a Research Council the effect at the global level when the clawback occurs, whatever size it is, means that the net grants to the Research Council to that extent are going to be reduced. So we are not in the situation of applicants going to Brussels and receiving additional money. They having done that, at that stage in that year, the next thing that happens is that the grants available to the Research Councils become reduced because of your accounting procedures, and therefore *our* ability to conduct research in this country,

which depends upon the level of *our* Research Council grants, will be impeded by this accounting procedure.

(Mr Mercer) In fact not. I think that that proposition rests on the notion that any reductions that are made in the budgets of Research Councils or in the funds available to the Research Councils from National Government are on the same scale as the increased resources which those Research Councils attract from Europe, and that is not the case.

225. No, the Research Councils do not attract anything from Europe, you see; it is the institutions and companies that attract the resources.

(Mr Mercer) Let me simply put the statement another way. The institutions that receive European money in this country get a genuine and additional increase in their resources, when it is all added up.

226. In the year in which it comes?

(Mr Mercer) No, in absolute terms, taking one year with another. That comes about quite simply because any adjustment that is made in public support for those institutions, as a result of European Community receipts, is in aggregate lower than the European Community receipts. To return to the little bit of arithmetic that I presented to the Committee in my opening remarks, if one looks at this new Research and Development Framework Programme, then the way in which the rules operate at the moment will *automatically* ensure, even before any other decisions are taken by Ministers, that for every pound of receipts which research institutions get or institutions in general get from the European Community research budget, at least 30 to 35 pence will be a genuine addition to resources. Or, if you like to put it another way, the adjustments that are made in other national flows to those institutions will be only some 65 or 70 pence for every pound that comes in. So at that aggregate level there is undoubtedly an increase in the resources available to research institutions in the UK.

Baroness Serota] But a reduction on what they receive from Europe.

Lord Butterworth

227. It may be a total increase, but it is an increase that is earmarked for particular activities. The effect of the clawback is that the Research Councils or ultimately the DES receives 65 pence in the pound less than it would otherwise do for the objectives for which it is deploying its funds.

(Mr Mercer) The whole principle of attributing to departments responsibility for particular aspects of European Community research—*attribution* broadly in line with their domestic sponsorship responsibilities—is to seek to ensure that adjustments which need to be made as a result of European Community expenditure take place, *as far as possible*, in the areas which are benefitting from that European Community expenditure. I underlined "*as far as possible*" there because, as I think I said earlier, there are bound to be some mismatches; there are bound at the margin, despite the global increase in resources to which I have referred, to be

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[Continued]

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cases where a particular institution does not actually feel that it has got its share, if you like, of this additional 30 to 35 pence that I have mentioned. It is precisely to cater for mismatches such as that that the scope exists for the departments which are responsible for the area of research covered by that institution to make bids in successive Public Expenditure Surveys, and those bids can then be considered on all fours with bids for expenditure in any other area within existing constraints.

Chairman

228. I would like to make a comment, in the light of what Mr Mercer has been saying. Why is it that all the Research Councils and universities who have sent us evidence have grave unease as to the consequences for their future resources for research and development? Why is that so? There is a uniformity of evidence about this before this Committee.

(Mr Mercer) I find it rather difficult to answer that, my Lord Chairman, other than saying that it is perhaps based on the misconception that the flow of funds which goes to them from Central Government is adjusted by an amount which precisely corresponds with any additional resources that they might get from Europe; that therefore, whatever they do, they are not going to be any better off by going to Europe for money, and indeed at the margin they might be worse off. As I say, that is a misconception, it is not the way in which the system operates.

Chairman] You have got an awful lot of work to do if you are going to remove this misconception for the Research Councils and, I suspect, also for this Committee.

Lord Lloyd of Kilgerran

229. I wish to follow up Lord Butterworth's important point. In following the principle of "anti-additionality", can you say whether HMG wishes to maximise the benefits of EC public expenditure in reducing United Kingdom domestic expenditure, given that the United Kingdom is a net contributor to the Community budget?

(Mr Mercer) Indeed, I think that some of the ground here has been covered in what I said earlier, so forgive me if I am repeating myself, but I am very happy to address the question exactly as it stands.

230. This is much more precise than what you have been telling us, is it not?

(Mr Mercer) Indeed so. As far as that question specifically is concerned, as I have mentioned, the UK's gross contribution to the Community budget, even after—

231. Perhaps you would not repeat what you have said already. Would you like to concentrate on the specific question?

(Mr Mercer) We have a very large gross contribution to the Community budget, so I think it would be perfectly reasonable to try to ensure that receipts actually served to offset the public expenditure cost of that contribution. The position, as I said, is not as straightforward as that. In the first place, some receipts do go to the private sector, and by definition

therefore those receipts do not offset the public expenditure cost of our contribution, though they do of course reduce the net contribution of UK plc to the Community. Secondly, again as I have said, prospective receipts are taken into account when public expenditure programmes are set.

232. I am sorry to interrupt you, but your answer is this, is it: that, in effect, HMG does *not* wish to maximise the benefits of EC public expenditure in reducing United Kingdom domestic expenditure? The answer to that is that you do *not* want to maximise the benefits?

(Mr Mercer) No, the answer to that is that HMG would not, I think, find it a sustainable proposition that receipts from the Community budget, public expenditure from the Community budget, should *not* reduce to some extent the overall public expenditure cost of our membership of the Community. The proposition, I think, which would be difficult to argue for is that the major gross cost of the Community in terms of public expenditure should not somehow or other be reduced as a result of the receipts which we get from the Community.

233. Thank you very much, I hear what you say. One of Mr Hogg's stated reasons (in a letter of 16 November to Tam Dalyell) for pursuing this policy is to ensure value for money. Is it not always possible that, however hard HMG might press for value for money in a certain area of Community funding, they will be outvoted in the Council? Are there not other ways of ensuring value for money?

(Mr Mercer) Perhaps I could ask Mr Corcoran to deal with that.

(Mr Corcoran) In looking at public expenditure, my Lord Chairman, the search for value for money is something that the Government attaches the highest priority to, and it is a continuing process. Mr Hogg's letter to Mr Dalyell reflects also the Government's view that there is no good case for distinguishing Community R&D from R&D which is directly funded from government departments. Both depend, as Mr Hogg says, on the same pool of resources and represent the same burden on UK taxpayers. It is for that reason that much the same public expenditure controls apply. What underpins those controls and the search for value for money is the way in which the Government considers that it is right to align policy with financial responsibility. That is at the heart of the attribution arrangements that take place.

Baroness Serota

234. I would like to come in here, for the purposes of clarification. Mr Corcoran has just repeated something that Mr Mercer said earlier in his opening statement, which I find some difficulty with. They have both said that EEC funding comes from the same pool of resources as UK public expenditure, and this is the global principle on which the Treasury policy is based. Is that really true?

(Mr Corcoran) Yes indeed.

235. EEC funding comes from the same pool of resources as UK public expenditure?

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[Continued]

[Baroness Serota *Contd*]

(*Mr Corcoran*) Our contribution to the European Community budget—

Baroness Serota: The *contribution*.

Chairman

236. But we make that in any case.

(*Mr Mercer*) It must none the less be met within a predetermined planning total for the overall level of public expenditure.

Baroness Serota

237. What must be met?

(*Mr Mercer*) Our contribution to the EEC budget.

238. But you said "EEC funding" which is different.

(*Mr Mercer*) By "EEC funding" what we were talking about was the United Kingdom's contribution to the European Community budget and hence, by inference, the receipts which the United Kingdom gets from the European Community budget. If you like, one can look at a flow of funds in relation to Community R&D which starts in London with the taxpayer, and the public expenditure cost of our contribution to the budget represents that money being transferred to Brussels which then gets transferred back to the UK private sector for research and development.

239. I think, Mr Mercer, you can assume that the Committee is aware of that. I was questioning the way in which you presented your case, and it has just been repeated by Mr Corcoran. I think it is an inaccurate statement to say that EEC funding comes from the same pool of resources as UK public expenditure.

(*Mr Mercer*) Our contribution to the European Community budget does. It is a form of shorthand.

240. The contribution, yes. I think that is one of the reasons why we are in some state of confusion about some of the answers you have given us.

(*Mr Mercer*) If the use of that shorthand has misled the Committee, then I of course apologise. Certainly, for the avoidance of doubt, when we have spoken of "EC funding" what we mean is the United Kingdom contribution to the Community budget representing public expenditure and therefore the receipts associated with that contribution—the United Kingdom's receipts flowing from the budget—equally being financed, albeit relatively indirectly, by domestic taxpayers.

Chairman

241. What are the policies of other States within the Community? Do they adopt the same attitude as you do?

(*Mr Mercer*) To be honest, we do not know.

242. You do not know?

(*Mr Mercer*) No. Other Member States' public expenditure systems are very difficult to find out about, as indeed I suspect the Committee might think is the case with the UK. However, it might be

worth pointing out that in relation to the report of the Court of Auditors, as far as transport infrastructure is concerned (which is the subject of one of the Committee's later questions), that particular section of the Court of Auditors' report also referred to the Federal Republic of Germany and Ireland as treating EC receipts in the same way as the UK is alleged to do in that report.

Lord Renwick

243. I must admit, my Lord Chairman, I have been having difficulty this morning in absorbing the highly complicated and beautifully delivered evidence we have been hearing. I am forced to take recourse to a principle that I sometimes use when I am in trouble, which is the lowest common denominator. If I can ask a question and receive a simple enough answer so that I can understand it, then I think everybody can understand it, and this is what I am going to try to do. I believe Mr Mercer comes back time and time again to public expenditure control. This, I believe, is the Treasury way of ensuring that public expenditure is distributed in presumably the most effective way, and then it is the accounting procedures which are presumably the Treasury's way of ensuring that the public expenditure has been made according to what does seem to me to be a highly complicated formula. I was going to ask the question that our Lord Chairman has just asked you, as to how other countries within the EEC seem, to my knowledge, not to have the problems with their research organisations of feeling threatened for funding not weekly or daily but at least monthly or six-monthly. I was sorry to hear Mr Mercer's answer that he did not know the control procedures and systems of other countries. Presumably we can find evidence of that elsewhere, but I was wondering whether I could ask Mr Mercer this. Obviously he is subject to the systems and the control systems that are in existence, but I cannot for the life of me believe that there cannot be developed a further simpler framework which gives the impression of not *largesse* with our money, thank you very much, but at least that it is given honestly and in a way that ensures proper use, without these highly complicated systems which I do not believe I yet understand.

(*Mr Mercer*) The systems indeed are complicated. Systems for any form of public expenditure control tend to be complicated. The principle that underlies them, however, I think is not especially complicated, and that principle, as I say, is the same for expenditure associated with European Community activity as it is for domestic expenditure, for *all* forms of expenditure. It is quite simply that any increase in expenditure above a predetermined level—and that predetermined level, in the jargon, goes by the title of "the planning total"—has to be bid for by departments concerned during the course of annual Public Expenditure Surveys, has to be justified by those departments in terms of value for money and other considerations and has to be considered against overall macroeconomics and public expenditure constraints. The complexity of the systems for control of expenditure associated with

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European activity—and I do concede they are complex, as someone who has to operate them day by day—exists simply in order to ensure that to the maximum possible extent those principles which apply to defence expenditure, social security expenditure and unemployment and training expenditure apply equally to European-related expenditure, simply because were they not to do so then European-related expenditure would be in an anomalously distinct position from the totality of public expenditure.

Lord Butterworth

244. I wonder if we could try to get at it another way. It seemed to me, if we take the view of simple men like Lord Renwick and myself, that we were under the impression that Britain made a contribution to Europe, to Brussels; that that sum is then passed over to Brussels and becomes theirs, nothing to do with us, and that they have, under the EEC, the power to distribute that in accordance with their rules. We have learnt this morning that when it comes back to us as research and development, there is a procedure whereby certain of it can be clawed back by reducing the grant in future years at, as you say, the global level. Can you explain to us why you do not follow that procedure with the Structural Funds? I understood from the beginning that with the Structural Funds you practise or you observe the rule in Europe of additionality; that that money is regarded as being additional. I deal best with concrete cases. Let us take Birmingham. Birmingham, under the Structural Funds, receives funds in order to build an enormous conference centre at the centre of the city. Those funds from the Structural Funds were presumably additional to anything else that Birmingham was spending, and there was no accounting procedure by which any attempt was made from any department to claw any of that back, because as far as Structural Funds are concerned, we believe in the application of the principle of additionality. Is that right?

(*Mr Corcoran*) Yes.

245. Why, then, do we have a difference with the Research and Development Fund?

(*Mr Mercer*) We believe in the principle of additionality as it has been now defined in this Committee, in the case of research and development and in the case of the Structural Funds. As I have said, for research and development we can actually give you—which I think we could not, ironically, for the Structural Funds—a measure of additionality as regards the new Framework Programme. I apologise for continually coming back to this point, but that measure of additionality is 30 to 35 pence per 100 or, in absolute terms, something like £250 million over the next seven to eight years. As to the distinction which my Lord, Lord Butterworth, raised concerning Structural Funds and R&D, the difference there is the different character of the receipts. The Structural Fund receipts are public sector receipts very largely; they flow to public sector bodies, government bodies, local authorities such as Birmingham, as Lord Butterworth mentioned. That means that they do represent public expenditure

as and when they are used. They represent public expenditure because they are spent by public bodies. That means that they can be, and should be, taken into account in the public expenditure planning process. That was my earlier reference to departments' programmes being set at higher levels in the survey than could otherwise be afforded in expectation of receipts. They are part of the public expenditure planning process because they are public spending. Private sector receipts, however, for R&D are different. Because the expenditure associated with the receipts does not represent public expenditure, the control mechanism or the way the controls are applied rests on judgments about the extent to which the implicit use of taxpayers' resources in generating those receipts should be an unrequited increase in resources for United Kingdom research.

Lord Gorell

246. Could I ask a question really to demonstrate my total ignorance of this subject? To the extent that you are going to claw back what is given into Brussels—60 per cent or whatever it may be—why do we support giving this money to Brussels in the first place? Why do not we just allocate that 30 per cent in our own way, in direct lines that we in this country would like to see, rather than doing it in this roundabout fashion?

(*Mr Mercer*) I think, with respect, that it follows, as night follows day, from our membership of the Community. It is implicit at least in our membership of the Community that we accept that there are certain activities—and research is one of those activities—which, in particular respects, can be carried out better at European Community level than they can be carried out at national level.

247. But then your deduction is not that which the European people can do better; you are deducting something which specifically in the UK we would like to do.

(*Mr Mercer*) I again return to this concept of matching or not matching. We would hope that during the process of negotiating framework programmes for European Community R&D we would seek a shape and content of those programmes and a general orientation of priorities within those programmes which was broadly consistent with United Kingdom research priorities, such that any adjustments which were then required to public sector flows to United Kingdom research institutions broadly matched or were in areas which corresponded with the increase in resources which was coming from Brussels.

Lord Ironside

248. I am, like the others, slightly confused about what has been said. One point that you have made earlier on is that the R&D Programme represents a transfer of resources from the public to the private sector, then you said that it was predominantly so, and then you used another adjective to say that that was not quite right either. However, what I do know is that government research establishments do bid in the R&D Programmes in Brussels, and therefore

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not all the money is transferred to the private sector by any means. Therefore, can you give me some sort of figure or proportion of what this is? My second question is that in the R&D Programme now a lot of money is leaking out (if that is the right term) to the EFTA countries who are able to bid for this particular money. I would be interested to know what rules they apply to additionality.

(Mr Mercer) As far as the first point is concerned, my understanding is that the proportion of United Kingdom receipts from the Framework Programme which goes to the private sector is 90 per cent or thereabouts, and the public sector is the residual of 10 per cent. I confess not to knowing the answer to the second question on money leaking out to EFTA. I was not aware that money from the Framework Programme was available outside the European Community. It is certainly a point which I would like to check up on, if I may.

249. This is fairly new now, but not only are the R&D Programmes involving cross-frontier deals within the EEC and private/public sector partnerships, but this is also being stretched out to the EFTA countries.

(Mr Mercer) Perhaps I may ask Mr Corcoran to deal with this, as he is more acquainted with this than I am.

(Mr Corcoran) I do not think it is a case of Community money leaking out to EFTA countries.

250. I used the wrong word.

(Mr Corcoran) Yes, I think that what you are referring to is the fact that the Framework Programme provides for a certain amount—not very much, but a certain amount—of collaborative research with non-EEC countries. That was taken as part of the framework decision; that the kind of research that is provided for under the Framework Programme does provide such scope, and that there would be advantage if some of the research that is undertaken is undertaken with non-EEC countries up to a small degree. But the monies involved are not leaking out to EFTA countries.

251. It is EEC receipt monies; it is EEC money, surely, for the R&D Programme?

(Mr Corcoran) Yes, and will be used in collaboration with non-Member States, but Member States will be benefitting from those small bits of collaboration.

Chairman

252. I thought that I was, when I first came here this morning, quite clear. I must say, I am becoming more and more bemused as to the situation! Should a shift in emphasis away from enabling technologies (primarily the responsibility of the Department of Trade and Industry) to science occur, Research Councils and universities are worried that the attribution of Community funding to their budgets will affect their freedom to set priorities for funding projects. Is there a danger that decisions taken in Brussels, where such bodies have no formal representation, could override domestic priorities? Is the Treasury aware of the possibility of "double

jeopardy", ie that the United Kingdom Science Budget suffers because of EC programmes and that EC support for activities which the Research Councils might not consider of the highest priority would have to be topped up from the same depleted science budget?

(Mr Mercer) I think that perhaps the first point to be made here—and it is straying slightly away from my own departmental territory and may indeed touch on evidence which you have already had from the Department of Trade and Industry and the Cabinet Office, but I think it is worth stressing in this context—is that the United Kingdom's negotiating priorities in relation to any given European Community research programme are formulated in this country very much by reference to the research and science community. There are well established formal and informal links between the relevant departments and the relevant Cabinet Office secretariat and representative research bodies in this country. So that the UK negotiators go to Brussels, if you like, with a clear idea of the sort of priorities and activities which we think it would be appropriate for European programmes to cover.

253. Do you consult with the Councils before you go? The Councils are not represented in any way, are they?

(Mr Mercer) They are not directly represented. It is my understanding that the departments concerned—and, as I say, I am away from Treasury territory here—do indeed have formal and informal links with the research community (if I could put it that way). That means that, as I say, they go to Brussels with a fairly clear notion of what is generally accepted as being the sort of thing we think the Community ought to be supporting. In recent years we have been, I think, fairly successful in shifting the balance and the content of European Community research towards areas which we ourselves in the UK would regard as being broad priorities; towards, for example, activities which support industrial competitiveness. What that therefore means is that we have achieved a certain amount of matching between Community research and what we regard as important in this country. However—and again I think it is a point that came up earlier—membership of the Community, by its very nature (particularly since some of the sub-programmes under the main Framework Programme are adopted by a qualified majority, whereas the Framework Programme needs unanimity), is bound to mean that from time to time decisions in Brussels, in the Commission, are not entirely consistent with our domestic priorities. That can, as I have said, give rise to quite difficult decisions at the margins in relation to public expenditure controls. But the way that the controls apply, as I have tried to demonstrate, is such that adjustments in domestic programmes are made as closely as possible in line with the areas which derive benefit from the European research. To the extent that there is clearly *not* correspondence in that respect, it is open to Ministers to consider the matter in the course of the survey.

254. Has the Treasury made any study into the

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[Continued]

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effects of "anti-additionality" over private and public sector research and development?

(*Mr Mercer*) No, we have not. We have done no study as such. The Treasury is made aware, inevitably, each year—just as departments are made aware each year, again in the context of the public expenditure planning procedure—of areas where the shoe is pinching, if you like, areas where the application of controls is causing difficulty. I think it would be fair for me to say that it is accepted that where it can be demonstrated that there are serious difficulties arising out of the control, in relation to an area of activity to which genuine priority attaches, judged relative to a whole series of other areas, then there is no question of the principles which I have been seeking to outline being applied mechanistically; they are applied flexibly.

255. With all this widespread concern, surely it might be prudent by the Treasury to carry out such a study?

(*Mr Mercer*) I think that if it were to be the case that, in the course of successive annual Public Expenditure Reviews, it were to be revealed that problems are more than just shoes pinching in particular areas, then obviously we would want to consider that. However, that is *not* something that has arisen in the course of successive Public Expenditure Reviews.

Lord Sherfield] I would like to make a general remark to which I do not necessarily expect an answer from Mr Mercer. In view of my past, as you might expect, I have the greatest respect for Treasury doctrine, Treasury practice and Treasury logic, but it does not always follow that the application of logic takes sufficient account of the human condition and human affairs. We are dealing here with a special area research and development and the scientific community who, not perhaps for the last two years when it has been better, but for the previous ten years have been very much squeezed. I think that most of us around this table and on the Science and Technology Committee feel that to be the case. Here we are dealing, as I say, with a particular community who are making bids to Brussels. To make bids to Brussels requires a great deal of effort and energy. I cannot help feeling that in general it is very much to the advantage of the country that these bids should be successful, and that there should be an incentive on the part of these various organisations to make the effort and get the money out of Brussels. There is a widespread feeling, which has been expressed, that in fact there is a disincentive to these organisations to try to get this money. Therefore, I am simply saying that the application of logic to certain human situations does not always achieve a very sensible result.

Chairman] Is the Treasury aware of that concern?

Lord Sherfield] I would also say that I think I do understand the lapidary language of Mr Hogg's reply to Mr Tam Dalyell, and to add how impressed I have been by Mr Mercer's effective defence of Treasury practice and Treasury control.

Lord Gorell

256. I would like to put one corollary to this, if I might. Equally, is the EEC less likely to grant money to UK institutions, to roads, to this that and the other, if it is aware of the fact that it merely reduces the Treasury contribution to those things?

(*Mr Mercer*) I would like to make two points, if I may. Firstly, in view of Lord Sherfield's very kind remarks, I ask him to forgive me all the more for contradicting, if I may, his point about incentives to apply for European money, because it seems to me that the incentive upon the research community to apply for European money, given the way in which the controls operate, is extremely strong indeed, because were it not for that flow of funds to the research associations—to the research community, let me say—then the operation of the present rules would mean that there were reductions being made in flows of funds from the UK public sector to the research community which were not matched in any sense by additional resources to the research community coming from Brussels. That is to say, the existing rules would serve to try to reduce the public expenditure cost of our contribution to European Community R&D, and if we were not getting receipts then, as I say, there would simply be a reduction in flow of funds to the research community. As it is, the research community has a clear incentive—which indeed has operated, given the fact that our receipts, as I say, are at about 20 per cent of the total—to bid for Community money not simply to ensure that their budgets are not reduced, but to ensure, as is the case, that the totality of the resources available to them, whether from Whitehall or from Brussels, is greater than would otherwise have been the case.

Lord Renwick

257. To clear up Lord Ironside's question to Mr Mercer some time ago on the transfer of funds from the public to the private sector, I understand Mr Mercer has some concern here. The Treasury obviously has to have that, because that seems to trigger off the whole system. Could you explain that and explain the worry? Could you put some detail in it? I would have thought that the private sector would have been using funds on research, it would be deploying scientists, etcetera, for research which would be presumably productive effort and would have a return. Why is it so very different from the public sector?

(*Mr Mercer*) I am sorry that I gave the impression that somehow I was concerned about the principle of the transfer of funds from public to private sector. It is not that principle. It is, if you like, the whole area with which the control of public expenditure in the macroeconomic sense concerns itself. If one boils down the principles that we have been talking about today, and indeed the whole principle of public expenditure control, what we are seeking to do is to ensure that, consistent with running the services and all the rest of it which we all want, the burden on the taxpayer is as low as possible. The burden on the

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taxpayer, if you like, in that sense can be characterised as a public resource; that burden on the taxpayer, translated into public expenditure, becomes a public resource. It is that public money which gets transferred through the European Community R&D Programme to the private sector. One's concern is not that the private sector is somehow not able to make use of that money. The concern is simply to ensure that the burden on the taxpayer is kept as low as possible consistent with the proper operation of the policies concerned.

Lord Gorell

258. Can I return to my question? Is it not likely that there is a lesser likelihood of EEC grants being made to this country if it is known that this country thereby in part reduces government expenditure, and we do not know whether that occurs in other countries?

(Mr Mercer) Hypothetically, I think the answer to that is yes, I think any Commission *would* be less likely to make funds available to the UK out of the Community budget if it were felt that those funds were simply going into the maw of Central Government and nowhere else. That is why I think it is particularly important, in the case of the Structural Funds, for example, to go back to the language of the relevant piece of legislation which Mr Corcoran read out earlier, and to underline the fact that the UK has subscribed to that, of course we accepted the legislation, *and* that we can demonstrate that UK practice is in line with that legislation. In those terms, to the extent that that particular piece of legislation represents the basis on which the Commission construes additionality, then the UK is conforming with additionality, and there would therefore be no basis for the Commission to deny funds which might otherwise have been available to the UK, on some perceived grounds that we were not practising additionality.

Baroness Serota

259. Purely on this narrow question of additionality and the Structural Funds, could I ask Mr Mercer this, as I might have misunderstood him earlier. I thought he said at one stage that it was not possible to give a measure of additionality for Structural Funds. I was somewhat puzzled by his answer and wondered why that was so. Can you help me, Mr Mercer?

(Mr Mercer) Yes. The reason for that is that, as I have explained, the prospect of Community receipts is taken into account when the relevant public expenditure programmes are set, but it is only one factor amongst an enormous number of other factors, obviously, that have a bearing in the survey process on the overall level of departments' programmes. It is therefore not possible to say the precise extent to which a programme may be higher, all other things being equal, because of anticipated Structural Fund receipts. What one *can* say, of course—and one can say it without any qualification—is that the Structural Fund money will all be spent on the precise projects for which it was intended.

Chairman] Are you satisfied with the answers to that?

Baroness Serota] No, I am afraid I am not!

Lord Gorell

260. Turning to an example of "anti-additionality" in the transport field, the Committee have previously expressed concern at the failure of HMG clearly to treat Community money for transport infrastructure projects as additional. This concern has been shared by the Court of Auditors in Chapter 10 of its Report for 1988. Are you able to respond to such criticism? Is this not the clearest indication of how Community money for R&D will be treated?

(Mr Mercer) The Court of Auditors (if I have found the same reference with which the Committee is concerned) mentions three particular examples, I think, in which it is claimed that support from the Community did not increase the budget of the recipients in this country. I think there are three points here. One of them I have mentioned just now. For the avoidance of all doubt, I must make clear that receipts are always devoted to their intended purpose. Structural Fund receipts always go to their intended purpose. Secondly, the Court of Auditors was concerned with public sector receipts for the Structural Funds and, as I have explained, the treatment of private sector receipts for R&D is rather different. I think the question asks whether these particular examples have any relevance for R&D. They do not. Finally, the Court of Auditors I think is concerned with, or reports upon, only what happens, again in accounting terms, when the receipts actually arise. It notes, for example, that, in one case, in practice the receipts were appropriated in aid of the Department of Transport's Vote. What the Court of Auditors fails to mention—and I apologise again for continually coming back to this fact—is that other things being equal, the prospect of EC receipts will have enabled that Department of Transport Vote to be higher than would otherwise have been the case; ie the receipts will already have been taken into account when the level of that Vote was established. It therefore follows, when one gets down to the accounting level, that the receipts when they come in should be appropriated in aid of that Vote—that is to say, they should finance that Vote—rather than financing expenditure in addition to that Vote, because the Vote already includes an amount relating to the expenditure in question.

Baroness Serota

261. Could I ask why the Court of Auditors was not made aware of that answer?

(Mr Mercer) I think the Court of Auditors was indeed made aware of that answer.

262. But it still wrote its report?

(Mr Mercer) Yes. It would not be the first time that the Court of Auditors has retained a passage in its report, despite caveats from national authorities.

Chairman

263. Does the Treasury accept the distinction between subscriptions to activities such as CERN,

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Mr M C MERCER and Mr M CORCORAN

[Continued]

[Chairman Contd]

where the option to withdraw exists, and which should therefore be balanced against domestic expenditures, and the Framework Programme, where there is no such option for the United Kingdom to withdraw?

(Mr Mercer) Perhaps I could ask Mr Corcoran to deal with that.

(Mr Corcoran) The Government certainly does accept that there is a distinction which can be drawn between discretionary and non-discretionary expenditure. It is something that happens across the range of public expenditure. In that it *does* happen across the range of public expenditure, a distinction is not drawn when considering public expenditure totals and, as Mr Hogg's letter made clear, there is no case that the Government sees for treating the contribution to Community expenditure on a different footing from other public expenditure. What I would like to add to that is that the question itself suggests that there is a very black and white distinction. What Mr Mercer has tried to get across in discussing the survey arrangements is that those arrangements are in place to consider the balance of domestic expenditure, which is a point which the question itself suggests that the Committee is concerned about. That is the way in which discretionary and non-discretionary expenditures are brought together in the planning system, and that is something that happens every year.

264. Some witnesses who see the logic of attribution have called for greater flexibility. What arrangements exist for research funding to be carried over from one annual PES round to another? Could this system be expanded?

(Mr Mercer) As far as the particular rules for the control of expenditure associated with European receipts are concerned, there is indeed specific flexibility built into the arrangements. That flexibility takes the form of a rather lengthy time-lag whereby any associated reduction in departments' programmes takes place only some time after the event,

ie some time after the Community budget expenditure in question has taken place, and sometimes after the receipt has come into the UK. If perhaps I could give an example, under the 1990-94 Framework Programme there will not be any significant expenditure, and therefore no significant receipts, until 1991. As far as UK public expenditure is concerned, any adjustments that are required to departments' programmes as a result of those receipts will not be made until the 1992-93 financial year. That, I think, is a considerable flexibility; it allows, amongst other things, an opportunity for Ministers to consider on more than one occasion the scale and the nature of any domestic adjustments that might be required in relation to that Community budget expenditure. The other thing, of course, that it does mean is that any action on the ground, if you like, in terms of a research institution's budget, stemming from European Community expenditure, only takes place some considerable time after the European expenditure itself has taken place. So there would be no question of simply saying to a research association, "You've got X from Europe, therefore you're going to get X minus 1 from the UK." On any given day it does not happen that way; there is a long process of deliberation between an amount of European Community money being made available and any domestic adjustment taking place.

265. Mr Mercer, Mr Corcoran, thank you very much indeed, on behalf of the Committee, for being present before us today. It is a difficult subject, but you have kept your cool, and I think we are a little bit more aware of the difficulties and the problems and also of the Treasury view. There are a number of questions which we have not been able to deal with. I wonder whether you could let the Clerk have an answer to those questions by way of a written reply?

(Mr Mercer) Indeed, my Lord Chairman.

Chairman] That will be most helpful. Thank you very much indeed.

Supplementary Written Evidence from HM Treasury

Q. "Who decides on the attribution of EC money to certain particular budgets? How exactly is it done? As far as R&D is concerned, is advice sought from the scientific community?"

A. Ministers take account of prospective public sector receipts from the EC budget when they determine the level of Departments' programme in successive annual public expenditure Surveys. Programmes can thereby be set and maintained at higher levels than could otherwise be afforded. Receipts are directly associated with the relevant expenditure from those programmes, and attribution to particular budgets is not, therefore, an issue.

As regards EC spending on R&D, responsibility is attributed to individual Departments in line with their domestic policy interests. This is an institutional matter involving discussions between the Departments concerned, the Treasury and the Cabinet Office. The scientific community is consulted, both formally and informally, about the UK's priorities in relation to EC spending.

Q. "Is the interpretation of 'anti-additionality' sensitive to the distinction between what would have been done anyway without Community funds, and the greater scale of what might be done with such funds?"

A. The concept of "anti-additionality" as the Sub-Committee defines it is difficult to relate to the way in which the public expenditure implications of EC receipts are handled. As such, the distinction in the

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[Continued

question between what would have been done with or without Community funds is difficult to address. The key point, as explained in the answer above, is that domestic spending programmes are set at levels which take EC receipts into account and which are higher than could be afforded in the absence of those receipts.

Q. *"Is the Treasury aware of the possibility of 'double jeopardy', ie that the United Kingdom Science Budget suffers because of EC programmes and that EC support for activities which the Research Councils might not consider of the highest priority would have to be topped up from the same depleted science budget?"*

A. In terms of overall funding for R&D, double jeopardy would arise only if adjustments to domestic programmes associated with EC expenditure were greater than receipts from the EC. This is not in fact the case. As regards the 1990-94 Framework Programme, for instance, the overall adjustment will be much smaller than the receipts: the Programme will lead to a net increase of at least £250 million over the next seven to eight years in public sector support for the UK's research effort.

In terms of individual research Councils, there could in certain circumstances be a mis-match between on the one hand, the scale and nature of receipts from the EC and, on the other, any adjustment which might have to be made in levels of central Government support. This is one of the reasons why the UK has sought to ensure that EC R&D priorities are consistent with its own. In addition, the arrangements for adjusting domestic programmes allow for considerable flexibility and are therefore capable of dealing with serious mis-matches.

Q. *"Could you comment on each of the five specific examples referred to in evidence from Dr Thompson at the University of London?"¹*

A. Three of the cases are broadly similar in that they relate to EC grants to higher education institutions which pass through the account of a Government Department, or another public body. This means that the grants score as public expenditure in just the same way as other public sector grants. They must therefore be accommodated within a pre-existing planning total (the level of which will reflect, *inter alia*, prospective EC receipts). And Departments must consider whether the grants should have priority in relation to other forms of public expenditure; and whether they finance activities which are in the mainstream of domestic policy objectives. There are bound to be cases where Departments decide that expenditure associated with an EC grant is not a high priority item. The letter from Dr Thompson quotes three such cases; and also mentions a further case involving receipts from the structural funds to which the same principles apply. It would be possible to cite similar examples which would look similarly odd out of context in relation to almost any aspect of public expenditure control. There is nothing special in this sense about EC receipts. The crucial points are that resources are finite, public expenditure programmes are planned within pre-existing totals, and difficult decisions at the margin are therefore inevitable.

On the last of Dr Thompson's points, ESPRIT is complementary to the national IT programme and projects and partnerships begun in this country may well be further developed in the European context. But the national programme does still continue. ALVEY has been replaced by a programme called IEATP (Information Engineering Advanced Technology Programme). This remains a significant programme. Its budget is £130 million compared with the UK's implicit contribution to ESPRIT of £200 million.

¹Printed on pp 112-3.

WRITTEN EVIDENCE¹

Memorandum by the Agricultural and Food Research Council (AFRC)

INTRODUCTION

The Agricultural and Food Research Council (AFRC) was founded by Royal Charter to undertake research into agricultural sciences and related disciplines. The AFRC receives funds from the Science Budget, from MAFF and from other sources with which it conducts research in eight institutes and in University based groups. The total funding available to AFRC in 1988–89 was £122 million, which amounts to about 2 per cent of the total of the publicly funded research budget.

AFRC's research programme is primarily basic and strategic work in the biological sciences, from which knowledge is gained:

- to increase the efficiency of agriculture, food and other biologically based industries;
- to improve the quality and safety of food;
- to conserve the environment and lessen the ecological and social consequences of change, following altered patterns of land use.

The need to attract and train bright young people in the biological sciences is a key function of AFRC. The funding to universities (£9 million in 1988–89) provides resources for this. AFRC's eight major interdisciplinary institutes provide facilities unique to the UK for short term and long term training of post graduate and post doctoral research workers in the biological sciences (130 in 1985–86).

AFRC, as a matter of policy, is actively seeking more involvement in EC programmes and bilateral collaboration with European research institutions and organisations. The institutes of AFRC, well equipped and staffed, provide centres of excellence in their respective scientific areas, outstandingly able to act as lead or co-ordinating centres in the management of multi-institute European programmes. Good links have been established between AFRC and the EC permanent officials, in part through the Brussels office of the Research Councils, which also plays an important role in providing early warning of new EC scientific programmes.

How far is a European programme for R&D desirable at all?

International collaboration is essential to the efficient conduct of scientific research. European collaboration is important in that several other European countries undertake scientific research of high standard, and significant volume. The EC provides a framework within which European collaboration can be promoted, not only between the 12 Member States but (through the scheme for Co-operation in the field of Science and Technical Research—COST) also with non-EC European countries. The EC can help to bring about greater co-ordination of national activities through its "concerted action" programmes—which provide funding for meetings and exchange visits between scientists whose research is already funded from national sources. But concerted action may not be necessary where good informal links already exist between scientists. The case for the Community being involved in funding research projects, or running its own laboratories, is less clear—unless the work is such that it can *only* be done on a pan-European basis (see below).

Which are the areas where collaboration between the Community and Member States will be most beneficial?

Collaboration is most beneficial where one or more of the following criteria are met:

- (1) to allow more rapid progress than would be possible with national resources alone by the pooling of expertise and resources with overseas academic and industrial organisations.
- (2) to enable research to be undertaken of a scale and complexity that could not be undertaken nationally.
- (3) to make progress on questions which have an inherently international element, involving the study or use of overseas sites.

Examples of such areas in the AFRC's remit include:

- (1) response to environmental change and stress eg in the development of new crops to meet possible greenhouse effects;
- (2) major mapping programmes, eg on plant genomes, involving the best laboratories in each country;
- (3) animal health and trans-boundary animal health problems;
- (4) genetically engineered organisms which know no geographical boundaries.

¹Some of this evidence was produced in response to questions asked by the Committee. These appear in Appendix 3 to the report and are numbered 1–14. Certain witnesses were asked only some of the questions.

Are the six areas identified for Commission support the right ones?

The six areas are so wide ranging as to allow for the possibility of programmes which AFRC consider to be important to be included within them. It would be useful in describing the overall structure of the Programme if the Commission were to increase the number of sub-lines within each area. In addition to aspects of existing programmes on biotechnology, agriculture (including tropical agriculture), and the environment being carried forward, the AFRC would wish to see more concerted European action in research on plant molecular biology, neurobiology and immunology. These are areas in which the institutes of AFRC, usually located on university campuses to aid training, provide centres of excellence able to act as lead or co-ordinating centres in the management of multi-institute European programmes.

What value is such a vague Framework Programme as proposed, which gives almost no detail on the scope of particular projects to be covered?

The lack of detail on the scope of the research to be undertaken makes it impossible to judge the value of the Programme. There is no adequate basis on which to assess whether the research proposed will meet the criteria of "added value" or "subsidiarity", ie whether the proposals are such as to warrant Community action at all. We are convinced, however, that most of the areas are timely.

Is the Commission right to propose a new programme rather than revising the existing programme?

The case for proposing a new Framework Programme in advance of the completion of the review of the current Programme is debateable, although one can have some sympathy with the arguments advanced for the greater continuity which a rolling programme will provide. In practice it seems likely that there will be considerable continuity between the Second and Third Framework Programmes; many of the specific programmes in the Second Framework can be expected to continue, even if in a slightly different form, under the six main areas of activity described.

Has the Commission adequately justified the resources to be made available?

Is the balance of funding between areas correct? In particular, is the Commission right to reduce support for projects concerned with energy?

The Commission has not provided adequate justification for the total resources requested or for the balance of funding proposed between the six major areas of activity. The evaluation of the Second Framework Programme should have been completed before any increase in the budget was contemplated. No scientific case has been made for the increase requested by the Commission.

Before either the overall size or the balance between areas could be properly assessed, it would be necessary to see much more detailed statements on the Commission's objectives within each of the six areas, of the scientific programmes required to meet these objectives, and on how the costs of each scientific programme had been estimated—as would be expected in considering bids for additional funds nationally. In particular, more specific programmes should be identified within areas 4 (life sciences and technologies) and 6 (human capital and mobility).

The AFRC has no views on the reduction of support for projects concerned with energy, but sees solar energy utilisation, eg by plants, as an important area which should be included within the energy programme.

Does the long-term nature of R&D mean that the Commission is correct to set out funding over the four year life of the projects now?

It is reasonable to allocate funding for the work of individual scientists, or groups of scientists, for up to four or five years ahead. The Commission have not, however, revealed their detailed plans, at the project level, within the six broad areas discussed. Indeed, where funds are to be allocated on a responsive basis, detailed proposals at the project level have yet to be solicited. There is a case for allowing some flexibility in the way the programme develops. But, as stated above, the case has not been made for the increased funding requested. The plans put forward for the Second Framework Programme were much more detailed than those so far seen for the Third.

Should decisions about financing after 1992 be taken when it is clearer what budgetary arrangements will apply then?

Yes, and when the Commission has more adequately fulfilled the requirement to review the current Framework Programme.

Should a portion of the budget allocation for the programme be set aside as a reserve to cover financing of the new projects that may be deemed necessary when the programme is revised in 1992?

Individual programmes within the six broad areas are likely to involve staged calls for proposals during the period of the Third Framework. This should allow sufficient flexibility. A reserve should only be contemplated if the individual countries have as strong a voice in decisions on its use as they do in decisions on the adoption of the Third Framework as a whole.

Does the proposal give sufficient weight to the need for evaluation of projects?

The proposal expresses good intentions as far as evaluation is concerned. However, this could also be said of the proposal for the Second Framework Programme, for which the requirements have yet to be adequately fulfilled. It was surprising that in the course of the preparation of the Wise Men's report (The Report of the Framework Programme Review board, June 1989) there were no consultations with the heads of the UK Research Councils. If, for political reasons, the UK agrees to contribute to the new Framework at the level of funding proposed by the Commission, it will be even more important that evaluation is regularly and rigorously carried out. The content of individual programmes should be assessed every second year. It should then be possible for new initiatives to be undertaken through the redirection of funds when other areas of work are terminated, rather than through an overall increase in the size of the EC R&D budget.

How far does the new programme differ from the existing one? Has the Commission sufficiently justified the changes?

On the basis of evidence seen so far, it could be said that the new proposals are essentially a reformulation of existing programmes. The restructuring into six main areas (with some 14 sublines) follows the recommendations of the "Wise Men's" report that there was a need to regroup activities around a limited number of strategic axes. But the activities proposed under line 4 (life sciences and technologies) and line 6 (human capital and mobility) at least, seem to be essentially for an expansion of existing programmes, with (in the case of line 4) some increased emphasis on basic biology.

In setting up programmes, is Commission really clear about its priorities as to:

- (a) *the balance between research and development;*
- (b) *the balance between basic and applied research;*
- (c) *how "near the market" it is proposing to fund projects?*

The AFRC would wish to concentrate comment on (b) above. On the matter of balance between basic and applied research, in view of the emphasis of Community programmes on precompetitive research of relevance to European industry, it may in some areas be appropriate for Community research to relate to more applied work. Indeed, with the exception of the need to collaborate where large and expensive facilities are required (eg synchrotrons) or where the projects themselves are large scale (eg genome sequencing) the sort of collaboration in biology that meets the criteria of "added value" or "subsidiarity" can be towards the more applied end of the spectrum. The Commission's role in relation to smaller scale basic biology might be better exercised through some involvement in co-ordination of work carried out nationally, rather than through funding research in its own laboratories or on a contract basis.

The Commission has so far failed to review the existing Framework Programme. Is evaluation an essential element in research programmes? Does the Commission have adequate procedures to evaluate programmes and is it able to ensure that those of little worth are closed down? Are you satisfied with "peer review" as a method of evaluation?

The statement at the beginning of this question could cause hesitation to the extent that it should be recognised that several programme lines in the existing Framework Programme have only just started. There is, of course, no doubt that evaluation is an essential element in running successful research programmes—particularly so when programmes are to continue and expand. Evaluations should be made by independent, external advisers and the results made public. The Commission appears to have the facilities to set up adequate procedures, but some of the reviews of which we are aware have been less than satisfactory because of the inappropriate choice of reviewers, the time scale on which they were conducted and—consequently—a somewhat superficial approach. In the areas in which the AFRC has experience, there are few instances of less successful programmes being closed down.

The AFRC has taken a leading role in the UK in experimenting with modern methods of assessment, but believes that these should supplement rather than replace "peer review", which—despite the well rehearsed disadvantages (in relation to interdisciplinary subjects, some truly innovative projects, vested interests in specialised fields, etc.)—is still accepted worldwide as an important element in the process of evaluation.

How far should research funded by the Community be directed research rather than reactive research?

Most current Community research could be described as being—at least in broad terms—directed. Under the individual scientific programmes making up the second Framework Programme bids for funds are made in response to calls for proposals in specific fields—the choice of which is based on advice from the management/advisory committees for each programme. The Science Programme, in contrast, allows for applications in virtually any field of science. To have one such programme, within the overall Framework, seems reasonable.

Is the strengthening of European competitiveness a sufficient justification for the Community undertaking research already underway elsewhere in the world? Does the increasing number of areas of Community activity mean that there will be a growing need for research in new areas?

In those areas of science of interest to AFRC the research being undertaken is pre-competitive. The results of such work will generally be disseminated world-wide, and in turn will build on work being undertaken elsewhere in the world. Some new areas of Community activity might warrant complementary programmes of back up research. Correspondingly there will be areas of research where the case for Community action diminishes.

Are the details of projects settled sufficiently far in advance? Is it of concern that the Commission has been able to start new projects without political backing? Do you have any comments on the aeronautics programme agreed last year?

We interpret this question as relating to the publication by the Commission of the areas of science, within scientific programmes, in which bids for proposals will be invited. There are instances where more notice would be an advantage. Now that most applications must involve collaborations between scientists in at least two Community countries, preparation of proposals requires a longer time scale. It would be of concern to the AFRC if the Commission were to start new projects without at least seeking the advice of a wide variety of experts and interested parties, including Research Councils and Departments. The reference (in paragraph 6 of the Proposal for a Council Decision) to strengthening the consultation process with the scientific community is welcomed: the Research Councils are the appropriate bodies in the UK to advise the Commission on a range of experts from whom opinions could be sought to achieve a balanced view.

The AFRC has no comments on the matter of the aeronautics programme as such.

Should the Commission give emphasis when supporting particular projects to those which strengthen the economic and social cohesion of the Community and which encourage the role of SMEs? If so, can this be done without sacrificing the level of excellence of programmes?

While the Council believes that the Commission's objectives in giving emphasis to the two areas mentioned are entirely laudable, it would be counter-productive to sacrifice scientific excellence to achieve them—particularly since it is understood that other measures are available.

Concluding remarks

AFRC views on the above matters have been made known to DES (who have co-ordinated the UK response in areas of interest to the Research Councils) and Cabinet Office (who represent the UK line in Brussels). The Council accepts that its views have as far as possible been taken into account and that, where they are not reflected in the Commission's proposal, this is due to the UK view differing from that of other countries.

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Supplementary Memorandum by the Agricultural and Food Research Council

Attribution

In his oral evidence to the Sub-Committee, the Chairman of SERC spoke¹ of the effects, as far as Research Councils are concerned, of the system whereby the costs of EC programmes are attributed to Government departments. The concerns he expressed are common to all the Research Councils insofar as the UK share of the costs of EC programmes in the more basic sciences has to be met from the Science Budget. The DES will, no doubt, seek reimbursement of such costs in the Public Expenditure Survey. But if additional funds are not granted, the UK Research Councils will have to cut support for domestic programmes to which they might attach higher priority to fund the EC Framework—which over the coming years will almost inevitably continue to increase in size.

Professor Mitchell rightly highlights the political element in the decision on the overall size of the Framework Programme. The Sub-Committee will already be aware that the size of the third Framework was not worked out on the basis of consideration of proposals for specific research programmes. Only the briefest description was provided by the Commission (in Annex II of COM(89)397) on the broad content of programmes to be set up in 15 wide ranging research areas. The Framework was not, in other words, constructed on a "bottom up" basis. The AFRC will work to the best of its ability with the Commission—to the extent that they allow us to do so—to ensure the development of detailed proposals for each subject area that will result in a good use of funds. But neither the Research Councils, the ABRC, nor the DES have control over decisions on the total sums to be spent on areas such as Biotechnology or Human Mobility, the UK share of which is to be funded from the Science Budget.

UK representatives have, of course, been present at EC meetings where preliminary proposals for new EC programmes have been discussed. In cases of which we are aware, UK representatives have tried to

¹See pp 35–45 above.

resist pressures to increase the size of programmes, arguing for keeping costs down, but they have sometimes been in an isolated position in doing so. This is because representatives of countries without our kind of "EUROPES" system approach the question of increased Community activity from an entirely different perspective. They see an expanded Community programme as a means of gaining additional funding for the area of science for which they are responsible.

It could be argued that the Science Budget should only be used for the costs of international collaborations from which, on scientific grounds, the UK could withdraw. This could be said in relation to CERN, for instance, where the possibility of withdrawal was at one time seriously considered. The commitment to payments from which it is not possible to withdraw on the basis of scientific assessment is a quite unprecedented use of the Science Budget. The priorities for the use of the Science Budget have hitherto essentially been determined by the UK scientific community, but this will no longer be the case in relation to that proportion now to be paid to Brussels. It is true that we can, to an extent, win back funds for UK teams, but as Professor Mitchell said, this will not necessarily be for support of work to which we in the UK would attach priority.

If the attribution system is not to have a detrimental effect on British science, it will, therefore, be necessary for the Science Budget to be fully compensated, in each year's PES round, for EUROPES payments.

Letter from Professor W D P Stewart of the Agricultural and Food Research Council

Thank you for your recent letter asking for AFRC's comments on a number of points which arose from Professor Bill Mitchell's oral evidence. I have pleasure in enclosing my Council's comments on the questions you raised.

If the Committee requires any further information, AFRC will of course be happy to oblige.

Professor W D P Stewart
10 April 1990

The Relationship between Research Councils and the Commission

The views of the UK Research Councils on Commission proposals are channelled through the Department of Education and Science to the Cabinet Office Science and Technology Secretariat and the Chief Scientific Adviser. The Cabinet Office provide the UK representation on the Commission's senior officials science and technology advisory committee (CREST) which meets monthly in advance of the Research Council of Ministers. Senior DES officials attend meetings of the Heads of Research Councils in order to ensure that the Department and the Councils are kept informed of each other's thinking on EC matters. There are regular meetings of DES and Research Council representatives on specific EC issues and programmes. In cases where Research Councils have expertise in the area of an R&D programme in which DES is not in the lead, the relevant lead department may consult directly with them. For example, MAFF seeks AFRC's view on agriculture programmes, and the DTI on the current biotechnology programme.

UK representation on EC programme management committees and other advisory committees is handled by the Cabinet Office, with responsibility normally delegated to a nominated lead department. Lead departments may in turn involve the Research Councils. AFRC, for example, provides one of the three UK representatives on the Standing Committee on Agricultural Research.

Informally, there are many contacts between Research Council staff—both scientific and administrative—and the staff of the Commission. It is not easy to see how a more formal relationship between the Commission and Research Councils could be developed. Councils are not Departments of State, and Commission relationships with Member States should properly pass through the relevant departments. To the best of our knowledge, equivalent bodies in other Member States (CNRS in France, CNR in Italy and DFG in Germany) have a similar relationship with the Commission.

Industrial applications

The current Strategic Programme for Innovation and Technology Transfer (SPRINT) appears to be improving the links between EC basic research and industry, but there is no direct AFRC experience from which to draw firm conclusions. AFRC Institute staff were involved in some eleven of the "European Laboratories Without Walls" networks in the Biotechnology Action Programme (1985–89), and several of these networks had industrial members.

The Council's involvement in EUREKA has been limited since the purpose of the programme is to develop industrial applications which are generally too "near market" to be appropriate for the AFRC.

Economic and Social Cohesion and SME's

As the further written evidence from AFRC (December 1989) made clear, the Commission's objectives in these fields should be pursued by appropriate direct methods (eg the Structural Funds, the programme

for Science and Technology for Regional Innovation and Development in Europe (STRIDE) and the Community Action Programme in Education and Training for Technology (COMETT)), rather than via the Framework Programme. The Framework Programme is geared to improving Europe's R&D performance and should be driven by a commitment to the highest possible quality of research.

Memorandum by British Aerospace

Q1 How far is a European programme for R&D desirable at all? Which are the areas where collaboration between the Community and Member States will be most beneficial? Are the six areas identified for Commission support the right ones?

British Aerospace considers that a European programme for R&D is highly desirable, if not essential, in the developing European and world situation. Such a programme must of course be properly focused in order to justify the resources which need to be allocated to do it. The Framework Programme has developed in both form and content only during the 1980s, and at its present stage should still be further developed to build on its successes so far; its early content reflected long held concerns regarding economics, health, energy, etc; subsequent vital additions were made in the fields of industrial technologies, environment and safety. We believe that the six areas now identified for Commission support embrace to a satisfactory degree all these key areas, although we consider that the balance between these areas should be adjusted to some extent. You will be aware that British Aerospace has been a major practitioner in European co-operation for over three decades, and that such co-operation is a vital basis for the continued prosperity of our industry. But, for many years this co-operation was largely based on shared projects, with each company and each country conducting its own separate research and technology programmes. Over the past 10 years we have recognised the need for, and have sought a major increase in co-operative research and technology across Europe, due to the existing and foreseen limitations in company and national resources which can be applied in the field. We see the Commission's R&D Framework Programme as an essential means to this end. We studied this matter in depth in the EUROMART Study conducted by nine major aircraft companies in 1987-88 which preceded the aeronautics programme launched by the Commission. The common position of the nine EUROMART companies which resulted from this study is summarised in Annex A to this note.

Q2 What value is such a vague Framework Programme as proposed, which gives almost no detail on the scope of particular projects to be covered?

In the launch and development of the Framework Programme, a "shopping list" approach was necessarily employed which meant that consideration and approval of the programme up to the highest levels was largely based on a very detailed breakdown of the programme. We sympathise with the view of the Commission that the time is now ripe for Ministers to review the broad scale, shape and balance of the programme and the fundamental partitioning of resources across it, rather than a further incremental assessment of individual programmes within it. In this context we believe that the six areas identified by the Commission reasonably map the existing and proposed streams of effort within the Framework Programme. However, it is our view that there must also be effective measures for individual programme authorisation (and release of funds) subsequent to overall agreement of the Framework Programme at strategic level. This pattern is familiar to us, since it broadly matches our own method of approving and authorising our company R&D programmes.

Q3 Is the Commission right to propose a new programme rather than revising the existing programme?

We do not consider that this is a new programme in terms of broad content, but support the new "shape" as indicated in our comments above.

Q4 Has the Commission adequately justified the resources to be made available?

Our view is that such justification can only be made in general terms, particularly since subsequent authorisation must be made in due course for each programme. In this general sense, our view is again that with the progressive decline in funding resources on a national basis available for research and technology acquisition, and the limitation on a national basis of other resources (particularly specialist manpower and skills), increased levels of collaboration on research and technology acquisition on a European basis become ever more important. This collaboration must be driven by a central funding resource allocation, and in this context, the total budget of 7,700 MECUs is far from generous, and may well be inadequate. As a high level policy guidance for the future in this matter, it would of course be valuable if in the overall budgets for Community activity drawn up by the CEC, Parliament and Council there was some gross indication of agreed level of R&D activity as a percentage of the total budget.

Q5 Is the balance of funding between areas correct? In particular, is the Commission right to reduce support for projects concerned with energy?

If the Framework Programme is to be focused properly both with regard to content and to time, then any one area of technology must over a period of time (which can vary according to the area) increase, peak, and then descend in terms of priority and scale of effort. In this context, early concentration in Commission programmes was on energy, fusion, coal, then generic technologies such as information technology, medical and biotechnology, followed by a more recent emphasis on the environment and on industrial technology. In this sense, the reduced support on projects concerned with energy (in terms of percentage of the total, rather than actual levels) seems to be justified. Against this background, we would make one particular comment on the balance between the areas. We consider that in the Enabling Technologies the balance between Information Technology and Industrial and Manufacturing Technologies is not correct for the future. Very substantial effort has been deployed in recent years on Information Technology and Europe is now lagging further behind in Industrial and Manufacturing technologies than it is now likely to be in Information Technology.

Q6 Does the long-term nature of R&D mean that the Commission is correct to set out funding over the four year life of the projects now? Should decisions about financing after 1992 be taken when it is clearer what budgetary arrangements will apply then? Should a portion of the budget allocation for the programme be set aside as a reserve to cover financing of new projects that may be deemed necessary when the programme is revised in 1992?

Four years is a very short time in R&D terms. Hence the need for a long-term strategic plan which is updated at intervals (perhaps four years), but which contains within it sufficient flexibility to adjust at programme level as events arise. We understand that this is essentially what the Commission proposes, and the issues about financing after 1992 should therefore be accommodated in this way. Furthermore, such an awareness and approval of an overall financial profile, while commitment is made at lesser levels and at shorter intervals for individual programmes, should automatically (with a very small contingency allowance) cover the needs of new requirements as yet unknown. We believe this approach to be fundamentally correct: indeed we would consider it not acceptable to do otherwise in our R&D planning terms.

Q7 Does the proposal give sufficient weight to the need for evaluation of projects?

Whether the proposal makes clear or not, our experience is that the importance of independent evaluation is fully accepted by the Commission, and is reflected in their practices. However, the evaluation process must not be too rigid in the sense of waiting for final evaluation reports before any action is taken: interim judgements from evaluation and management authorities must be used for decisions on short to medium term programme actions.

Q8 How far does the new programme differ from the existing one? Has the Commission sufficiently justified the changes?

As indicated already, the BAe view is that while the structure is radically different from the existing programme, the content is essentially not. The change is one of management philosophy (an unfolding plan from overall strategy to individual programme), which we support, even though it is not presented in detail in the proposal.

Q9 In setting up programmes, is the Commission really clear about its priorities as to:

- (a) the balance between research and development;*
- (b) the balance between basic and applied research;*
- (c) how "near the market" it is proposing to fund projects?*

In all the matters questioned, clear demarcation is in many cases not possible, and often not desirable. Furthermore, a spread of basic research, applied research and technology demonstration is to be expected. The necessary agreement on priorities and balances must be based on judgments which take into account differing objectives and requirements of individual programmes, together with the maturity of the technology involved. For instance, the work on bio-technologies is clearly still in the research stage, although it may embrace some basic and applied research, whereas the work on information technology is equally clearly applied research, with a leaning towards development. By definition, the Commission must disengage when market driven aspects come to predominate if it is to stay in the "pre-competitive" field. "Degressivity", as a concept for decreasing community funding while increasing industry funding as programmes get nearer to the market is being explored by the Commission. We believe that pragmatic judgments by the Commission can be, and usually are, made in these matters.

Q10 The Commission has so far failed to review the existing Framework Programme. Is evaluation an essential element in research programmes? Does the Commission have adequate procedures to evaluate programmes and is it able to ensure that those of little worth are closed down? Are you satisfied with "peer review" as a method of evaluation.

We understand that the Commission has provided a report of a review by an independent panel on the existing framework programme, although we have not seen anything of this nature. Evaluation is an

essential tool in research management, but as indicated above must be carried out on a progressive basis, and not used as a rigid barrier. Peer review is acceptable as a method of evaluation, providing that it is not used in isolation.

Q11 How far should research funded by the Community be directed research rather than reactive research?

The question is not clear to us. As far as we are concerned all research is directed towards objectives which are derived from our long term plans and aspirations.

Q12 Is the strengthening of European competitiveness a sufficient justification for the Community undertaking research already underway elsewhere in the world? Does the increasing number of areas of Community activity mean that there will be a growing need for research in new areas?

The maintaining of European competitiveness is a major justification to us for Community supported collaborative research. Any high technology industry needs to stay on the "leading edge" of a wide range of rapidly developing technologies. This cannot be sustained by "buying in" technology from elsewhere in the world, firstly because competitors will not normally sell what they perceive to be their own crucial technology advantages, and secondly because it is not possible in many cases to properly acquire a technology without a "hands on" involvement in its development.

Q13 Are the details of the projects settled sufficiently far in advance? Is it of concern that the Commission has been able to start new projects without political backing? Do you have any comments on the aeronautics programme agreed last year?

Details of "projects" (which are contained within the programmes) are developed subsequent to individual programme authorisation and launch. Details of programmes need to be settled soon enough for the eventual programme to be meaningful, but not so soon as to eventually launch a programme which would not then be needed or would not justify a first priority. We believe that the Commission's new proposals will facilitate this approach, provided that effective measures for individual programme authorisation subsequent to overall Framework Programme agreement are put in place. With regard to the aeronautics programme launched at the beginning of 1989, we believe that it was subject to the full process of political approval through the Commission, Parliament and Council as required by established Community procedures.

Q14 Should the Commission give emphasis when supporting particular projects to those which strengthen the economic and social cohesion of the Community and which encourage the role of small and medium sized enterprises? If so, can this be done without sacrificing the level of excellence of programmes?

The answer to the first questions must be yes in principle, but it is very difficult and complex in practice to afford such emphasis, and while aiming for it, it is not reasonable to expect total coverage. This is recognised by the Commission in their attempts to adopt special methods to help in this matter under other programmes (for instance in the regional assistance to strengthen research infrastructure in disadvantaged areas under DG16). Some sacrifice in the level of excellence of programmes must sometimes be accepted in making an emphasis of this nature, and the acceptable level of this sacrifice must be a matter of judgment on a case by case basis.

November 1989

ANNEX A

A EUROPEAN INITIATIVE IN AERONAUTICS (Common Position of the Nine EUROMART Companies)

The Commission of the European Community has launched a programme which forms a two-year pilot activity in strategic research for aeronautics. This current programme, which has been accommodated within the framework of the Commission's BRITE/EURAM programme, is based on the outcome of the EUROMART Study conducted by nine aircraft companies in 1987-88.

The nine EUROMART companies attach great importance to the Commission initiative to improve the competitive position of the European aeronautics industry by means of a common strategic approach to aeronautical research and technology acquisition for Europe, particularly in the face of the powerful measures being undertaken (with strong government support) in the United States and emerging countries. The current programme is an essential first stage in this endeavour.

The EUROMART Study Report comprises an executive summary, main report and 16 annexes. The Report shows that aeronautics, which encompasses not only the aircraft manufacturers but also their suppliers of engines, equipment and materials, has made a major contribution to Europe's industrial base

in terms of employment, the wide range of high technologies deployed, and large and increasing exports. Advanced technology played a major role in gaining this industrial position and will be vital to maintain it.

The European aeronautics industry has achieved a strong penetration (25 per cent) of the highly competitive civil world market. But to maintain or increase this share it must keep a command of a very wide range of state-of-the-art technologies and anticipate new developments.

To do this, a major increase in co-operative research and technology acquisition across Europe is needed, due to the existing and foreseen limitations in company and national resources which can be applied in the field. The few existing schemes for co-operation, although beneficial, are not fully adequate for this purpose for the reasons set out in the report.

A new scheme is required to support this new form and level of co-operation. To have any chance of success, the new scheme demands a focus and an imperative that can only be provided by government intervention at Member State and Community level. A substantial programme on strategic research for aeronautics by the Commission is seen to be the only practical way to provide such a focus and such an imperative at the lowest overall cost; the current programme launched by the Commission is a crucial pilot activity for this approach.

The current programme, as a pilot activity, is made up of selected research activities which are very important in relation to medium and long term aeronautics technology requirements. The programme will act as a "demonstrator" which will be self-contained, but which will help to define subsequent Community action in terms of both form and content. This longer-term action should embrace all the key technology areas required for aeronautics.

In summary, it is submitted that the aeronautics industry is vital to Europe, and that its future depends on remaining competitive. It is believed that the overall cost of remaining technologically competitive can only be made acceptable by a major increase in the level of co-operation in Europe, and that the only feasible means to this end is through substantial Community action based on success in the current programme. It is further believed that, if this opportunity is missed, there will be a progressive erosion of Europe's competitive position, which may irreversibly impair the future of the industry.

February 1989

Letter from the Confederation of British Industry

Thank you for inviting us to submit evidence to the enquiry into the Framework Programme, COM(89)397. We would make the following comments in answer to your questions.

Question 1

Members believe that Framework should focus on research areas which require a supranational approach such as the environment, biotechnology, telecommunications, transportation, enabling technologies, and technical standards; and fields where Europe has a strong base, for example, health research and software development. In this respect members are satisfied that the six areas of research identified by the Commission are appropriate, and that these are of strategic importance.

Question 2

The current Framework Programme has 37 specific programmes, each having a budget and timescale. The Review conducted by the group of five independent experts (June 1989) recommended a reduction in the number of programmes to make the focus clearer and facilitate modification during the lifetime of the Programme, thus increasing flexibility. The Commission has adopted this approach in their proposal in order to minimise both legal and financial rigidity.

Question 3

Members fully support greater selectivity and the proposed re-grouping of research activities, together with the idea of a rolling Programme to allow funding of new areas, but at the same time provide some continuity for existing projects. However, some members feel that the suggested overlap of two years is too long, and may encourage existing "favoured" projects to be funded at the expense of new research activities. Conversely, the new Programme should not detract from the satisfactory completion of existing projects.

Question 4

Members feel that support for research on a European basis is increasingly important given the progressive decline in resources from national governments. The proposed budget represents just 3 per cent of the overall EEC budget, and members believe the sums requested to be reasonable.

Question 5

Members broadly agree with the balance of funding between the different areas, in particular the emphasis on enabling technologies. Many members believe that industrial and materials technologies should receive a greater balance of funds, and there is widespread support for the funding of the management of intellectual resources, the environment, and health research; information and communications technologies and energy would therefore receive a smaller proportion of the budget. More generally, it might be useful to relate the merits of the proposed budget mix to the goals of the new Programme based on evaluation of the impact of existing sub-Programmes.

Question 6

The independent Review Board (June 1989) noted the lack of flexibility of the existing five-year budgetary system, and suggested either provision of a reserve fund or a rolling 2-1-2 programme with allocation of funds on a three-yearly basis. The Commission has adopted the latter approach, and as budgetary arrangements for 1993 and 1994 have not yet been agreed, has estimated the spending limits for the whole period of the proposed Framework Programme, as required by the Treaty.

Question 7

The Commission proposes a mid-term review of the new Programme before allocation of the budget for the final two years. In addition, it aims to improve the efficiency of programme management through greater decentralisation and better monitoring of projects. Members fully support these goals and believe that objectives and timescales should be better defined. In particular industry should be given a greater role in the management of activities, the formulation of new sub-programmes, and the mid-term review of the Programme.

Question 8

Under the existing Framework Programme the budgets for each of the 37 specific sub-programmes were agreed and such sums aggregated to produce the overall budget for Community Research and Technological Development. In contrast, the proposals for the new Programme identify six broad areas of research to be supported, and indicate the maximum level of funding required. If accepted unanimously, these proposals would allow specific sub-programmes to be agreed by a majority vote. This would minimise both legal and financial rigidity, and members strongly support this approach. Members believe the proposed budget represents the minimum level of funding necessary to support a critical mass of Community research.

Question 9

To a large extent the balance between "basic" research, "applied" research, and "near market" development flows from the areas of research identified. At any point in time different technologies will be at different stages of development and therefore require the appropriate support: for example, biotechnology is clearly less mature than information technology, and therefore requires a greater balance of "basic" research. Members support such a spread of funding, rather than any bias toward "basic" or "near market" research as currently favoured by the UK Government.

Question 10

Review and evaluation of research must operate at two distinct levels: that of the overall Framework Programme, and the specific sub-programmes. Members are satisfied with the independent review of the existing framework Programme which reported in June 1989, and the proposed Programme includes provision for a similar mid-term review and evaluation. Assessment would be made easier if the overall Programme had a clear mission statement. At the sub-programme level there could be some improvement in current Commission procedures. Members believe that the existing win-bid rate of around 10 per cent is too low, and that this discourages the participation of SMEs and results in wasteful multiple bidding from larger companies. Greater transparency at the programme definition stage would improve the situation, and members feel that a win-bid rate of 30-50 per cent would be desirable.

Nonetheless, members are generally satisfied with the quality of the Commission's evaluation of bids, but the existing "peer review" of sub-programmes could be improved. The present system is dominated by academics and government officials, and members feel that greater industrial-input should be allowed. Any potential conflict of interest could be overcome by ensuring an appropriate balance of industry, academic, and Government representation, and such a balanced approach is commonly used for the evaluation of national research programmes.

Question 11

It is not clear what is meant by the terms "directed research" and "reactive research". Members believe that research programmes should normally be directed to specific objectives, but that some provision (5-10 per cent) should also be made for "blue sky" or "basic" research.

Question 12

Europe clearly requires a stronger research base in order to improve its competitiveness. In this respect it is crucial that European research is based on the likely future needs of world markets, and does not simply

emulate initiatives in the US and Japan. Clearly the activities of competitor nations are important, but Community research must be based on detailed assessment of future global markets rather than simply following existing technological trends.

Question 13

At present, members feel that broad details of potential sub-programmes are available sufficiently far in advance provided companies have access to the appropriate information networks. However, greater transparency at these early stages might increase the participation of SMEs; often by the time formal applications are requested, many potential collaborative teams have already been formed. On the question of new projects, members believe that it is important that the new Programme has a reserve of 5–10 per cent to fund unsolicited proposals, and that such proposals should be allowed to fall outside the six broad areas of research identified in the proposals. This would ensure that the new Programme is more flexible than the existing one. Members do not believe that the aeronautics programme agreed last year was started without political backing as this still had to go through the normal decision-making process.

Question 14

Members agree that the Commission should continue to place emphasis on programmes which strengthen the economic and social cohesion of the Community. Collaboration between companies in the north and south of Europe is particularly valuable in this respect, and although some loss of excellence cannot be ruled out in the short term, there is growing evidence that in the longer term greater integration is being achieved. The role of SMEs is more problematic. Some isolated pockets of excellence exist, but in general SMEs perform little formal R&D and many find collaborative research with larger companies difficult. However, many SMEs are much stronger at "near market" research and development work, and it is in such areas that support is required.

Dr J Tidd
Technology Group
13 December 1989

Supplementary Explanatory Memorandum by the Department of Trade and Industry/Cabinet Office

Subject Matter

In the period since the previous Memorandum was submitted further discussion has taken place in the Council of Ministers (on 17 October) and the Commission has provided supplementary information on the detail of the programme. It has therefore been possible to develop the UK position further.

Explanatory Memorandum 8375/89, submitted by the Department of Trade and Industry/Cabinet Office on 2 October, was considered by the House of Commons Select Committee on European Legislation to be legally and politically important (37th Report, 1988–89 Session, item 11421). The House of Lords Select Committee on the European Communities referred the proposal to Sub-Committee B (Progress of Scrutiny 17 October 1989). The Scrutiny History of the current five year Framework Programme (1987–91) is attached at Annex A (*not printed*).

Ministerial Responsibility

The Secretary of State for Trade and Industry has overall responsibility for the United Kingdom's interests in European Community R&D. The Secretaries of State of other Departments have an interest in R&D in specific sectors such as energy, health and the environment. The Secretary of State for Education and Science has an interest in the parts of the framework programme which concentrate on more basic aspects of research.

Legal and Procedural Issues

The proposal is based on article 130 Q1 of the Treaty of Rome and Article 7 of the EAEC Treaty.

The co-operation procedure with the European Parliament is not applicable.

The Council will act on this proposal by unanimity.

No legislation, whether subordinate or other, will be required to implement the proposed decision.

Policy Implications

The Council of Research Ministers has discussed the Commission's proposals at two meetings, on 18 September and 17 October. The first discussion concentrated on the overall priorities identified in the proposal, and the Council asked the Commission to supply additional information on the proposed research activities. The information received is attached (Annex B—*not printed*). The UK government, along with several other Member States, has maintained that this additional information remains insufficient for a proper appraisal of the programme. The text of Annex II of the proposal, describing the technical content, is accordingly being revised in meetings of the science advisers of Member States.

The October Council focused on a number of institutional and legal aspects of the relationship between a 1990-94 R&D programme and the current budgetary perspective for the Community which extends to 1992. Discussion of these aspects is continuing in Coreper, the committee of Member States' permanent representatives to the Community.

The UK accepts that the areas identified for Community R&D are broadly correct. The Framework Programme, once agreed, will be implemented through specific programmes based on proposals to be brought forward by the Commission. In the interests of a clearer understanding of the detailed programmes to be proposed, the UK government would like to see more lines and sublines identified in the framework and a much larger number of specific programmes than the six intended by the Commission.

Activities in the fields of IT and telecommunication (line 1 of the proposal) and industrial technologies and materials (line 2) play an important role, through the development of common standards and underpinning generic research, in preparing European industry for the Single Market in 1992. The UK supports Community action in these fields in areas of pre-competitive R&D. Nearer-market research leading directly to product development is not considered appropriate for Community action; it should be undertaken by industry, using the Eureka mechanism for collaborative research in appropriate cases. The UK also considers that the rate of growth proposed for line 2 is too large, particularly since a new programme in this area under the 1987-91 Framework Programme has only recently been initiated.

The environment (line 3) is clearly an area of increasing international concern though the Commission's proposals for this area need greater clarity. It should be noted that the balance of funding in the new proposal shows a significant increase in support for environment in comparison to the current Framework Programme. The Life Sciences programme (line 4) will bring together some existing Community programmes in areas such as health, agriculture and agro-industrial research, and will also include more strategic research underlying many aspects of biological science. While recognising the importance of much of the work covered by this line, the UK government considers that the proposed level of activity at the Community level has not been justified.

Energy research (line 5) relates in part to certain commitments under the Euratom treaty. The relative importance proposed for this area as a whole shows a definite reduction from the present programme. Encouraging the mobility of European scientists (line 6) is an activity which the Community is well placed to carry out, and previous programmes in this field have created some useful collaborations. The UK and other Member States have argued that mobility programmes should not be restricted to post-doctoral researchers. The information provided by the Commission on their proposals for this line falls far short of that necessary to justify our agreement to the level of expenditure proposed.

The UK would also like to see additional clarity for the resources to be allocated to work at the Joint Research Centre. We would also accept the addition of a line or subline for transport research, subject to agreement on its size and content.

The UK Government would also like to see a greater emphasis in the text on good management practice including satisfactory procedures for the appraisal of R&D proposals and evaluation of programme results. In particular, thorough evaluations of the 1987-91 Framework Programme and the first years of any new programme should be conducted during 1992. The Commission is appointing outside management consultants to advise on their current management system and to improve co-ordination between the DGs with interests in R&D, in response to wide ranging criticisms by the Review Panel.

The Council of Ministers has not yet considered the overall level of funding or the relative balance between the different lines in any detail. The UK view is that all the proposals must be soundly justified by the necessary technical information, offer the added value necessary for action at Community level and respect agreements on the overall budgetary perspective for the Community. It follows that any funding for the years 1993 and 1994 would have to be established by a subsequent unanimous decision by the Council once the successor to the current Inter-Institutional Agreement has been agreed.

The relevance of the Community's R&D proposals to the UK's own research priorities varies between the proposed action areas. There is need for action at European level in IT and telecommunications and the Community programmes have an important role. In other areas, while recognising the quality of some of the research conducted, we reserve judgment on its value to the UK. It remains our view that research conducted at Community level should provide general benefit to the whole Community and should be generic rather than aimed at specialised industrial or regional sectors.

There is no single view on EC R&D programmes from the UK scientific community. Individual Government departments are responsible for making their own soundings on the new proposal among industrial bodies, scientific organisations and research institutes and take account of these views in developing the Government's response. The CBI and all the UK Research Councils are among the bodies consulted. ACOST has also given its views. At the individual level, many of our scientists speak favourably of the stimulating effect of working alongside colleagues from other Community countries. The additional support from Community programmes gained by research teams is also welcome, though UK groups also complain of the large effort needed to prepare a proposal.

Through our general contribution to the Community budget the UK contributes nearly £200 million annually to Community R&D. This is in addition to the UK's existing government funding of R&D which amounted (in 1987) to 1.13 per cent of GDP. This figure compares with 1.39 per cent for France, 1.28 per cent for the USA, 1.10 per cent for FRG and 0.76 per cent for Italy. The UK's share of payments under EC R&D contracts is above 20 per cent in most programmes, somewhat higher than our contribution to Community resources.

The UK's contribution to R&D expenditure financed through the Community budget comes from the same pool of resources, and represents the same burden on domestic taxpayers, as does direct funding of R&D by Government Departments. Much the same public expenditure controls are therefore applied.

Responsibility for Community expenditure on R&D is shared by a number of Departments. Provision for such expenditure has been allocated to each of them. If expenditure exceeds, or is expected to exceed, planned levels, Departments' domestic public expenditure baselines are correspondingly reduced at the beginning of each year's Survey. Departments can bid for re-instatement of some or all of these reductions and such bids are considered alongside all other claims for increased spending in the annual public expenditure round.

This approach is designed to ensure:

- (i) that Departments adopt the same rigorous approach to value for money in terms of Community expenditure as they do in terms of domestic expenditure;
- (ii) that inevitably finite resources are allocated in line with relative priorities; and
- (iii) that expenditure from the Community budget is treated on the same footing as any other form of public spending.

Financial Implications

The programme would have a budget of 7,700 million ecu (£5,133 million) which would be provided from the budget of the European Community.

Timetable

The Commission (and Presidency) hope for agreement by Council by the end of 1989. The next discussion by the Council will be on 15 December.

Douglas Hogg MP
Minister for Industry and Enterprise
Department of Trade and Industry
22 November 1989

Memorandum by Professor H Newby of the Economic and Social Research Council

1.1 The Value of European R&D Collaboration:

The Commission's R&D Framework Programmes have been characterised by an overwhelmingly technological orientation divorced from human resource issues. Although the objectives of the Programmes—improving the quality of life, improving competitiveness—appear to imply a wide scope for the application of economic and social science knowledge, the Commission has promoted an almost exclusively technical interpretation of its remit. The ESRC has sought to increase the social scientific element included in the new Framework Programme, but with the exception (nonetheless welcome) of a socio-economic element in the environment line, there has been little change from previous programmes.

1.2 This technical orientation stems from the narrow remit of the sponsoring departments (DG12 and DG13). Many of the important questions that could usefully be tackled by social and economic analysis in fields such as demographic change, information and communications technologies, management behaviour, agriculture, health and regional policies, are considered to be the responsibility of other Directorate-Generals. ESRC considers that a parallel Framework Programme of social and economic research could usefully be undertaken to support the Commission's activities in other areas of its competence. At the moment, the Commission spend large sums of money on social and economic research contracts that receive little scrutiny from the Member States, with respect to both subject matter and results. Nor is there any attempt, in the spirit of the Single European Act, to co-ordinate national research efforts between Member States in the social and economic sciences. Consequently, a lot of research effort across Europe is duplicated or pursued at a sub-optimal, usually national, level.

1.3 One very clear example is the grossly inadequate capacity of DG2 to undertake the scale of economic and industrial policy analysis desirable to carry through the Single European Act, and the parallel inadequacy of the resources made available to the SPES (Stimulation Programme in Economic Science) programme in supporting the work of DG2. Another example is the absence of an integrated research effort in exploring the common problems of European nations in the face of the demographic changes that will concur in the next two decades.

1.4 In principle, ESRC accepts the value of a collaborative European research effort in a wide range of applied social science subjects that are of central concern to the Commission's activities: industrial, economic and regional policies, health and welfare systems, agriculture, the environment and relations with other nations.

2.1 *The New Programme and the Lack of Detail:*

(Questions 2 and 4) The lack of detail, both substantive and financial, in the Commission's proposal is a reflection of the general incoherence of its decision-making. The Single Act requires the Commission to respect the principle of "subsidiarity", and empowers it to co-ordinate national research programmes. The mechanisms for achieving co-ordination are weak, and the management of programmes, while variable, is generally poor. These criticisms were also made in the Report of the Five Wise Men. It is not surprising, therefore, that the Commission is unable to put very much detail into the scope of the new programme, or to justify the scale of the resources required, since the objectives of the Commission's R&D policy are very broadly specified, and do not arise out of a tightly controlled and well managed rolling programme of research.

2.2 The ESRC is particularly disappointed at the lack of detail in the Human Capital and Mobility (line 6) proposals, and their apparent bias towards the natural sciences and technology. The quality of applications received under the Stimulation Programme in Economic Science which was launched in 1989, suggests that there is enormous scope for extending the integration of the European social science research community. While the proposed post-doctoral "mobility" scheme is attractive, we can see no valid reason why it should be restricted to the natural sciences.

3.1 *The Balance of Funding Between Areas and Over Time:*

(Questions 5-6) The Council's limited involvement with the Framework Programme means that it cannot comment in detail on the issues underlying these questions. We would, however, wish to stress the value of a European involvement in social and economic research on the environment. This is an area of research that is currently underdeveloped and where research resources are surprisingly thin on the ground. The ESRC has initiated a number of large and medium-sized programmes on environmental issues, including one that will be conducted throughout the European Science Foundation. Nevertheless, the fact that the research issues involved are intrinsically international in character, and have very important international policy implications, suggests that a co-ordinated long-term programme of research on a European scale would be more appropriate than fragmented national programmes.

3.2 The Commission also has a potentially unique role to play in the development of a genuinely European research community through support for Europe-wide networks of research teams ("centres of excellence"), and schemes to encourage mobility of researchers. National research councils inevitably face difficulties in pursuing collaborative work. Their funds are, by definition, geared to national requirements, and cannot be used to fund researchers in other countries on any major scale. Additionally, it is often difficult to co-ordinate programmes and financial arrangements across national boundaries. ESRC is pursuing a policy of co-ordinating research priorities with the CNRS in France and the DFG in the Federal Republic, but the scale of such co-ordination is likely to remain relatively small. In this context, centrally-funded responsive or initiative mode programmes on a European scale, which involve researchers from a number of countries, will have an important effect.

4.1 *Evaluation:*

It is common ground that evaluation of projects undertaken by the Commission has been inadequate in the past and that there is little evidence that new procedures will be introduced in the future.

Letter by GEC-Marconi Limited

I list below brief answers to your questions as numbered in your letter.

Question 1

Collaboration in Research on a European scale is desirable for two reasons

- (a) successive generations of technologies, whether they be material technologies such as silicon, or systems such as telecommunications, demand investment on successively larger scales, involving the resources of more than one company in more than one country
- (b) investments such as these can only be made for large markets, preferably on a world scale but resting with reasonable assurance on a home market such as Japan, USA or Europe. Homogeneity in a European market requires an informed choice of standards.

Information technology and telecommunications are fields that are very dependent upon collaborative research and development.

The six areas seem a sensible choice to me when we list the issues that are going to dominate our lives in the next few decades.

Question 2

"Framework" is an apt choice of name, for what European industry needs is a framework established by governments and the Commission within which industry can choose its alliances and investments with some confidence in stability of regulations and government policies. The instrument of detailed change is ultimately industrial investment.

The development of a detailed programme is an iterative process between industry, governments and the Commission. The Commission is now preparing a much more detailed breakdown in time for the Council meeting in December.

Question 3

The programme, although new, does have some continuity from the existing one. The essential idea is to obtain a rolling programme. A hiatus in two years time would introduce problems for industrial and academic research teams.

Question 4

Certainly for area 1 there has been extensive discussion with industry to determine what resources are required and what are available. The view of the Big 12 industrial concerns is that the proposal for area 1 represents the minimum desirable.

Question 5

It may be that the balance reflects a view of the resources of the right calibre that can be made available. It would be possible to change the balance in a rolling programme in the light of experience.

Question 6

For planning and investment purposes. European industry needs to have confidence of stability, hence the requirement for four year plans. Adjustments to funding can be made later, with sufficient warning time.

Question 7

We know the evaluation of projects in area 1 to be effective.

Question 8

Much detailed discussion between the Commission and industry (including small companies) has informed the planning of the programme. There is a strong element of continuity and changes have been justified.

Question 9

The commission is clear about (a) (b) and (c) including a view of the complementary nature of framework programmes and the initiatives such as Eureka for "near market" developments.

Question 10

The programme as a whole and individual elements have been reviewed. Two judgments enter here; one of the Commission, and one of the industry continuing to spend matching funds. Peer review is usually a judgment of the technical desirability and competence of research and researchers. This is subordinate always to harsher judgments of market possibilities and return on investment before industrial resources will be committed, or continued.

Question 11

A mixture is required.

Question 12

Yes.

Question 13

There may be justification for starting some work to stimulate the political process. However, many projects will be doomed to failure without political agreement. One obvious example is a European wide air traffic control system. The majority of the requisite technology exists: political measures will be needed to apply it.

Question 14

Yes, and they do. In general the level of excellence of the programme does not suffer, because there are several strong partners, but partners make unequal contributions and technology transfer to weaker

partners occurs. As long as intellectual property rights are adequately protected this process probably assists the establishment of a larger, more homogeneous market.

Dr. W.S. Bardo
Technical Director
GEC-Marconi Limited
29 November 1989

Letter from the General Electric Company plc

Question 1

A European programme helps UK Industry in a number of ways. It is particularly beneficial to us in competing with countries which enjoy more generous support from their own Governments than we do. The areas identified by the Commission are appropriate.

Question 2

It is difficult to answer this question. A Framework by definition establishes themes and boundaries. Definition of projects must be left to submissions from companies. These will vary, and the assessors can then judge which will help the European plan most. The alternative, of asking detached assessors to propose projects, would not be as effective.

Question 3

The new programme is a revision, with due attention being paid to new lines of research which are now more prominent and necessary than in the past.

Question 4

The amount of money available is small compared with the need and with the provision for other activities, such as agriculture. We in the UK must particularly value an initiative intended to bolster manufacturing industry, whose problems give rise to our balance of payments deficit.

Question 5

The Commission justifies this reduction in a convincing way on page 6 of COM(89)397.

Question 6

Most projects will take 3-4 years. The funding of them should be assured at the outset. There should be provision for varying the funding of individual projects in the third and fourth year, depending on progress, and it would be valuable to reserve a contingency of 5-10 per cent for new projects, or for increasing existing projects that seem particularly valuable.

Question 7

The Commission has always paid great attention to assessing and evaluating projects, and one sees no reason why they should change their practices.

Question 8

The programme differs considerably from the existing one, and in general the changes are justified. There is certainly a need for extra funding on materials and materials processing, as was demonstrated by the oversubscription to the recent BRITE/EURAM call. The artificial restriction in size of materials projects is a grave limitation on effective collaboration. However, the association of the Joint Research Centre with this change is not justified. Exploitation is more easily accomplished by placing the Research where Development and Production is envisaged.

Question 9

There is no correct balance between R&D which can be applied across topics and companies. The Commission is advised by working scientists and engineers with wide experience. The balance between basic and applied research is not subject to the same criteria. The support for industry is intended to improve collaboration, since fragmentation would help our non-European competitors. Basic research should always be open and collaborative in any case, and should properly be funded nationally. The Commission input should then be directed at achieving a balance between research in the various countries, so as to maximise the numbers of engineers and scientists being trained. There can be no objection to funding projects that are near to the market if we recognise that a primary aim of these schemes is to enable Europe to compete with Japan and the US. The Japanese, in particular, have no inhibitions about helping their companies to dominate markets.

Question 10

It should not be forgotten that industry pays at least half of the cost of these projects. Industry therefore evaluates them constantly, and will not pursue them if it feels that they are irrelevant or ineffective. Evaluation of fully funded projects is more necessary. The Commission pays great attention to evaluation of individual projects—some say too much. The description "expert assessment" is more appropriate than "peer review", and it is difficult to suggest an alternative.

Certainly one should never evaluate on criteria which change after the projects have been under way for some time as was done for the ALVEY programme.

Question 11

Once a field has been defined, it is better to let the companies and universities determine where they wish to operate.

Question 12

Absolutely so far applied research. In basic research we must be selective, but if we then make good progress, the rest of the world will leap on. Should we then abandon the field we have established because "research is underway elsewhere in the world?"

Question 13

The Commission is often criticised for being too bureaucratic, and it would be perverse to attack them for being pragmatic.

Question 14

There is a perennial problem of supporting small companies on long-term programmes which are far from the market. If we gave help to near-the-market projects, small companies would queue up for support. The problem then is restricting the funds available in an equitable way. You cannot mix small and large companies in the same project on the same terms. There must therefore be some funds reserved for them. Their ideas will not be as long-ranging or ambitious as the large companies, but that is not important.

C Hilsum

Director of Research

4 December 1989

Memorandum by General Technology Systems Ltd

GENERAL ISSUES

Question 1

The future of Western Europe depends upon its capability to exploit advances in technology for the benefit of its economy and the social well being of its peoples. No one nation of the EC has the technical or financial resources to compete in the global markets of today with the USA or Japan. Hence, since technological capability is derived from R&D it is essential to have a European collaborative programme.

The breadth of technology is vast and increases daily as new discoveries are made. It is therefore necessary to harness the resources available to address those areas of immediate vital importance to the economy and social issues. The Commission, after much study and consultation, has selected the six areas which take account of the needs of the Community into the 1990s. We support the selection made.

Question 2

The programme sets out the main objectives to be achieved. This is the most practical way to proceed to obtain the political approvals necessary and avoid argument on details by people unfamiliar with their relevance. Having obtained approval for the broad objectives, detailed new programmes will be developed in conjunction with industry and other technical experts from the Euro 12.

Question 3

Much of the new programme evolves from the previous framework programmes taking the results of research forward towards exploitation. New items are included to cover the new lines of research that have arisen, the growing concerns regarding the environment and the growing shortage of technical and scientific resources.

Question 4

The total resources budgeted are but a small percentage of what is spent in total on R&D in Europe. But not only does it provide funding for some of the most important research and development needs, it is also a very important catalyst to achieving collaborations between industrial concerns and academe.

The resources proposed are the minimum necessary to achieve a worthwhile impact on the problems to be solved. More could easily be justified. The figures proposed are limited by the amount that industry and other organisations are willing to finance as their 50 per cent contribution.

Question 5

In our view, yes it is.

Question 6

Most projects will take three to four years to come to fruition. It is essential to provide continuity over that period. Funding can be varied according to results and has been reduced in cases where these were not promising and some projects have been cancelled altogether.

Question 7

The Commission goes to great lengths to achieve competent and fair evaluation of projects.

For example, GTS has been invited on several occasions to carry out an audit of the work of the Commission's evaluators in ESPRIT. In the vast majority of cases we found the evaluations were carried out competently and fairly.

GTS would wish to emphasise the importance, however, of setting proper targets of achievement against time and ensuring monitoring mechanisms are in place and are used. Moreover, strategic planning should be done before implementing programmes, rather than after they have been running.

SPECIFIC AREAS OF SUPPORT

Question 8

The programme differs in a number of ways. In the case of areas of research started in previous programmes, the objective is to take the work forward nearer to the market so that the research can be exploited and increase the competitiveness of industry. The Commission is limited to funding only that R&D that is considered to be pre-competitive. In some areas where life cycles are shortening dramatically this is a major restriction. However, the introduction of demonstrator projects and technology integration projects is a good compromise since they allow industry to get a better feel of the likely effects of research and development.

The new Framework programme also increases the funding for materials research and industrial process technology both vital for the future of European industry.

The new programme has greater flexibility which will allow changes to be made with time.

Question 9

The balance between basic, applied research and development varies from topic to topic. Different areas are in different stages of development. For example, Gallium Arsenide technology is less mature than Silicon technology and should receive more support for fundamental research. But it is debatable whether basic research should be supported by the EC or nationally, however, it is beneficial to have more established links between university and industrial research.

Question 10

This statement is questionable; individual programmes such as ESPRIT have been reviewed and are already producing worthwhile commercial results. It must also be remembered that half the costs of a programme are met by those taking part. It is up to the organisations' management to ensure that worthwhile results are being achieved.

Programmes are reviewed by independent experts; this should not be identified with the UK's method of "peer review" which is a very questionable method in that it is not independent but more like an "old boys' club."

Question 11

Having defined the broad areas of research to be funded, actual projects result from proposals from would-be participants.

Question 12

If the Community is to be competitive in the global markets of today, it requires a strong technology base in those areas in which it is attempting to win market share. The technological capability can only be achieved if the necessary R&D is initiated. Hence the market decides what research is necessary irrespective of whether such research is being undertaken elsewhere in the world. The achievement of a successful competitive product is increasingly dependent on a combination of good product design and an efficient manufacturing process. The Community must develop capability in both areas. It cannot rely on exploiting the results of research elsewhere as this inevitably results in a penalty in the extra time it takes to bring the product to the market and the additional cost.

Question 13

The broad details of sub-programmes are available sufficiently in advance for these organisations that have indicated that they wish to take part in the programme and have made the necessary contacts with collaborators. The Commission offers help to companies to put them in touch with potential collaborators before formal applications are called for.

The aeronautics programme had to go through the normal decision-making processes, as have all other programmes. The aeronautics programme is essential if the Community wishes to continue to be a global competitor in this very valuable and fast-moving high-technology field. In the past, most of the aerospace research has been financed by Defence, but this support has been drastically reduced and the Commission is rightly moving to compensate for this shortfall.

Question 14

Certainly the Commission should continue to place emphasis on programmes which strengthen the economic and social cohesion of the Community.

Useful results in meeting this objective have already been achieved by incorporating teams from Greece, Portugal and Spain with companies from the more industrialised countries.

The problem of assisting SME's is difficult because unlike the USA, the majority of SME's in Europe are not research based. In our view the best way to help them is through the independent research institutions such as Fulmer Research, ERA Technology or PERA in the UK and the Fraunhofer Institutes in Germany. These organisations are very good at technology transfer and are experienced in working with SME's.

14 February 1990

Memorandum by IBM

Question 1

European-wide R&D programmes are arguably essential where:

- common standards are desirable, as in Communications;
- the investments required are too large for single states, as with JESSI, JET and the Human Genome projects;
- the research stands to benefit from drawing on the broadest possible science base; and
- the ability to compete with the USA and Japan calls for the enhancement of technological capabilities on a European Scale.

The areas proposed under "Enabling Technologies" are uncontroversial priorities and should contribute to the development of a stronger European industry provided that the projects are well chosen.

Areas under "Management of Natural Resources" are of wide public interest and commercial significance. They cover, for example, energy and biotechnology.

Proposed work under "Management of Intellectual Resources" is different in nature and difficult to evaluate. It is unlikely to contribute greatly to solving demographic shortages, but facilitating the movement of young research scientists can be expected to be good for research.

Question 2

A high-level decision is required on general directions at this stage. It would be premature to define projects and collaborators; indeed it might well be impossible to engage the interest of potential participants until some commitment has been made to broad areas of work.

Question 3

It is not of fundamental importance whether the required R&D is carried out under an existing or a new programme. It is important that it is undertaken in a timely way and that all follow-up activity is approved before the existing programme comes to completion.

Questions 4 and 5

The overall scale of expenditure is not out of proportion to national and international R&D expenditures and the balance between areas appears reasonable.

Question 6

R&D is a long-term activity; project participants will require some guarantee of stability. Nevertheless, it may be prudent to plan for changes in circumstances.

Question 7

Of course the programme must be properly monitored and evaluated. But I would assume that the inclusion of monitoring and evaluation plans was thought inappropriate for a strategic, as opposed to a management, document.

Question 8

I do not have detailed specifications of the existing and new Framework Programmes and cannot comment on the extent of their differences and their justifications. However, the Commission refers in paragraph 2 of COM(89)397 to a number of detailed studies bearing on this question. These include the mid-term review of the existing programme (September 1987), a report on the status of science and technology (December 1988) and an evaluation report by independent experts (June 1989). This material was presumably regarded as being of too detailed a nature for a strategic proposal to be considered at the highest levels, but should provide a basis for the Commission's recommendations. The general principle of conducting strategic research by review and adaptation of a long-term rolling plan is sensible and should be supported.

Question 9

COM(89)397 is not explicit about where projects will lie on the basic research-to-near market spectrum. But recurring references to "pre-normative" R&D indicate that many will be directed at regulation. And Annex II (The Activities) would suggest that other projects will be precompetitive, involving new technologies likely to be applied to a wide range of commercial opportunities. Achievement of collaboration between industrial partners, especially competitors, will provide a measure of assurance that commercial prototype development is not being funded. But avoidance of product development support has in practice to be delegated to expert officials undertaking appraisals of individual projects.

Question 10

You state that the Commission has so far failed to review the existing Framework Programme. Yet it refers to review and independent evaluation in COM(89)397 (see above). It also undertakes to ensure improved dissemination of results (paragraph 12) and improved management efficiency (paragraph 13), while special emphasis is placed on new control and evaluation methodologies (paragraph 13). If the Committee remains unsatisfied with these assurances and wishes to advise the Commission on management issues, it should ask for a broader evaluation methodology than provided by peer review alone. The Cabinet Office's "R&D Assessment—A Guide for Customers and Managers of R&D" provides a list of techniques (HMSO 1989).

Question 11

If it is accepted that some important Community R&D cannot be left to the private sector, it must presumably be directed by the Commission or Member States. But it should be reactive in the sense that it responds to carefully identified and prioritised emerging requirements.

Question 12

European competitiveness will depend not only on the existence of R&D results somewhere in the world, but on the development of advanced industrial capabilities in Europe which can only be brought about by participation in R&D. It is likely that R&D requirements will broaden and it will be necessary to make strategic choices between them.

Question 13

It is almost impossible to define a large programme project-by-project in advance. However strong the case for collaborative R&D, potential partners see its characteristically heavy bureaucratic overheads as a disincentive to participation and require central commitment before diverting scarce management and intellectual resources into project planning.

Question 14

The first priority should be to strengthen the Community's industrial competitiveness, in particular against Japan and the USA. Sometimes this may militate against social and economic cohesion and the encouragement of SMEs, but often there will be synergy between these different priorities.

Dr G W Robinson
8 December 1989

Memorandum by London University

1.1 London University views the EC's Framework Programme for R&D with some concern. It presents opportunities for our leading scientists and engineers to collaborate with other scientists and engineers in other Member States, which we welcome. The way the Framework Programme's activities encourage a

drift away from support for fundamental research to applied policy-oriented research is, however, a mixed blessing.

1.2 As an institution representing the largest number of academic researchers in one institution in the UK we are particularly concerned about the content of the Framework Programme, how it is determined, and subsequently how individual project applications are assessed and selected for support.

1.3 European Community research and development programmes have been almost entirely policy-driven, with research primarily designed to underpin broad EC goals. In the 1970s these were increasingly dominated by the desire to improve Europe's energy self-sufficiency. In the 1980s, the goal of helping European companies compete more effectively with the USA and Japan has led to 60 per cent of EC research funding being allocated to research programmes designed to reduce research costs in both new and established industrial sectors.

1.4 Additional EC research programmes such as STEP and EPOCH (supporting environmental and climatological research) and Science and Technology for Development (Third World agricultural and medical research) underpin other policy initiatives of the EC.

1.5 In contrast the UK's programme of research in areas of science, technology (and social science) has essentially been determined by governments, advised by civil servants taking advice from the Research Councils/ABRC, and industry. Funds have been made available to support "good science" in any field—judged by peer group review undertaken by the leading and most experienced scientists—and to assist scientific enquiry in fields given high priority (as the Alvey Programme did for information technology priority themes of interest to the UK).

1.6 The EC research programmes which most resemble the UK Research Council's support of fundamental research are the EC's SCIENCE and SPES programmes, which are to be found in Section III of the Framework Programme (Management of Intellectual Resources). The former aids transnational research in areas of the exact and natural sciences, while the latter is a small pilot scheme on similar lines for the economic sciences.

RELATIONSHIP BETWEEN UK AND EC RESEARCH PROGRAMMES

2.1 EC research programmes seem increasingly to be drawn up by administrators and civil servants following consultation with industrialists, with little or no input from scientists. The University of London, which carries out about 20 per cent of UK research in universities, is concerned with the consequences this has for scientific research—particularly as the funds available to support scientific research in the UK have been declining in real terms over the last few years.

2.2 With UK funding increasingly rationed by the Research Councils through the process of too many alpha-rated projects chasing too little funding, scientists have turned to the EC to seek support for research. Under the previous and current Framework Programme they have often found that funds are only available for projects in tightly defined subject areas, determined by processes to which few UK scientists have contributed.

2.3 There is, however, a fundamental dichotomy between scientists who wish to pursue scientific research in their chosen field (wherever it may lead them, and with whosoever they believe relevant to their line of enquiry), and precisely defined research topics designed to meet research targets forming part of EC R&D programmes.

EC ROLE

3.1 EC R&D programmes are developed through a process whereby EC officials (who propose them) take soundings from industry, national civil servants, and "experts", and refined through a process of political compromise involving discussions within the Council of Ministers (briefed by civil servants, who then deputise for them in detailed discussions within COREPER) and the European Parliament and Economic and Social Committee. It is not surprising that this process ensures that political/departmental priorities are the most important factors in determining the content of EC R&D programmes, followed closely by those of industry (which is well able to present its case to the EC and to national administrations).

3.2 The priorities that London University's professional scientific researchers may feel important cannot be well reflected by this process. This is a matter of concern only because the EC R&D programmes are beginning to be substituted for UK research programmes—where scientific priorities could more easily be reflected in the allocation of funds to support research. This matter is discussed below in the context of EC R&D funds criteria.

3.3 As EC programmes become more applied in nature, and as general UK research expenditure is adjusted downwards in ways that take account of the growing EC research budget, the content of EC programmes that may be replacing UK programmes is of increasing interest to us. We feel that the scientific input into the design and operation of those programmes is less than the scientific input to UK programmes that are effectively (and perhaps unintentionally) being downgraded in the process.

3.4 We believe that the potential problems that the change in the allocation of resources caused by the development of the European Community's R&D programmes needs to be addressed either by increasing the funds available to support fundamental scientific research in the UK, or by increasing the funds available to support fundamental scientific research at the European level (in all areas of the exact and natural sciences, and not just fashionable or industrially-lead areas) at a faster rate than hitherto.

3.5 The attitude to fundamental research shown by the drafters of the Framework Programme seems to use to have become somewhat confused. In essence research of this type has—as we understand it—been developed in three ways.

3.6 Firstly the SCIENCE programme was set up (initially as the Science Stimulation Action) to encourage the growth of bilateral research through the twinning or networking of laboratories. In addition funds were provided to encourage researchers to move to other laboratories to develop their knowhow and research techniques (confusingly known as a Research Grant), and a few bigger projects with a potentially deriveable end result—such as a supermagnet—were funded under Operations Contracts.

3.7 In little or no time the applied research programmes for information technology (ESPRIT), applied technologies (BRITE, later combined in BRITE/EURAM) and biotechnology (recently called BRIDGE) had developed basic research sections which encouraged their university twinning on projects, or university-industry research with longer term assessments of their potential industrial benefits.

3.8 Although it is difficult to monitor what is happening in Brussels from within the UK it has appeared to us that this occurred partly because some EC officials felt that they were missing things that the Science Stimulation action was highlighting as relevant to their programmes, and partly in response to industrial pressures. The latter point is complicated by our understanding that the attitudes to fundamental or basic research have varied from one industrial sector to another.

3.9 In the field of information technology we understand that the "Round Table" group of companies that played a major part in the formulation of the content of the ESPRIT initially resisted Commission efforts to involve leading academic researchers in the definition of the ESPRIT programming areas. (This may have encouraged the Science Stimulation programme in funding the Optical Bistability project—relevant to optical computing—as it was not originally included by the Round Table companies. This area of work is to some extent now being supported under the ESPRIT programme. Work on neural networks followed a similar route, with the Stimulation Action first recognising the importance of recent scientific developments in the field, and ESPRIT subsequently incorporating it.)

3.10 In the biotechnological area the attitude of industry has been different, (possibly because it is a less mature industrial sector). Discussions with the Commission suggest that the leading companies of Europe are continuing to press the Commission to give a high priority to fundamental research of the type undertaken in Europe's universities.

3.11 The third strand of research has been the development of studies designed to guide scientific research and development, through forecasting trends in science and technology (FAST) and strategic analysis (SAST). Work done under FAST has certainly highlighted other problems, including the need for research across disciplinary boundaries (as suggested in their "Optomatronics" report), and more research in the social sciences to help us to make the most of the advances of science and technology.

3.12 We feel that two conclusions may be derived from our experience of these programmes to date, and that these are relevant to the current and future Framework Programmes of research and development.

3.13 The first is that more thought and consideration needs to be given to the need for the establishment of a European programme of scientific and technological research at a fundamental level. This should be both a programme in its own right, and designed to complement the applied research programmes of the EC which have been developed to support policy goals such as improving industrial competitiveness and improving the environment.

3.14 At the present time the EC's programmes for fundamental or basic scientific research are a mixture of differing goals, including the need to train young researchers, to enable all researchers to access large scale facilities in other states more easily, to set up more cost effective research teams, to bring together the "critical mass" of disciplines needed to solve complex (often transdisciplinary problems), and to encourage the transfer of know how from developed to less developed parts of the European Community. In addition some of these activities are intended to support applied research programmes.

3.15 The EC's confusion on this point is reflected in the choice of wording in the Framework Programme to encompass these activities: "MANAGEMENT OF INTELLECTUAL RESOURCES—Human capital and mobility". We believe that our ability to solve the major problems that confront Europe, and to develop our societies in ways that better meet the needs of our citizens (including our ability to compete in the world with our political and economic systems), are inextricably linked to the quality of our science, engineering and social science. We further believe that in a number of areas we can best address these problems by working together. We are not, however, convinced that the approach of the Framework Programme to identifying the right areas of fundamental research, tackled in the right way by appropriate

groups of people drawn from different countries, will lead to these results being achieved in an optimum manner.

3.16 The second conclusion we draw from our experience and our study of the EC's existing Framework Programme is that the EC needs to give an increased emphasis to areas of social science than has hitherto been the case. In the main the EC has seen the solution of problems as being technology-driven. While we have no doubt that advances in science and technology will make important contributions to assisting the EC in the attainment of policy goals, we feel that they will not be sufficient in themselves, and that greater attention than hitherto needs to be paid to the social sciences.

3.17 The generally quick appraisals of EC policies that have been undertaken for programmes like ESPRIT seem to us to have played a useful role in highlighting some shortcomings to the Commission. They have, however, left us with the impression that they may have been undertaken as part of an exercise designed to convince the European Parliament that all is well, and to convince Member States that money spent on the Framework Programme is good for Europe—and that more of the same is therefore needed.

EC RESEARCH PRIORITIES

4.1 It is right that general policy priorities for the EC should be determined by the political process. This process will reflect the interests of the Member States, with inevitable compromises to determine that the priorities of most Member States are accommodated.

4.2 While we accept that the aims and objectives of policies need to be determined in this way we are not convinced that the process of assessing the alternative means of realising the aims and objectives adequately reflects the experience of Europe's scientists, engineers or social scientists.

4.3 We are unable to see how we might assist Ministers and their advisers who are working on the development and refinement of EC scientific research programmes, for example, for we know of no formal or systematic mechanisms by which the views of scientists in London (or elsewhere in the UK) are sought with regard to the development or modification of EC programmes of scientific research.

4.4 The development of a separate programme for fundamental research, with a systematic process of agreeing ends and selecting projects by peer review would, in our view, be of greater assistance to the European Community.

4.5 We have no doubt that collaborative research, undertaken by teams of scientists, engineers or social scientists from different Member States of the European Community, is beneficial for Europe.

4.6 There are many problems that can best be addressed by bringing together the handful of experienced specialists to work in collaboration. At times this is necessary to avoid needless duplication of expenditure on expensive equipment. At other times it would be helpful because there are few people working in a particular field (perhaps a new and potentially important field, or an established area of considerable difficulty). On other occasions it may be because it has just been recognised that someone working in Area "A" has developed insights or techniques relevant to the resolution of problems in Area "B".

4.7 It is helpful that these economies (scientific or economic) of scale should be addressed through European programmes of research. Europe's scientists, engineers and social scientists share many aspects of education and discipline, but experience teaches us that differing national emphases and insights can be helpful in finding solutions to complex and difficult problems.

4.8 While the principal of European collaboration is fully accepted by us we are concerned about the practice by which areas of research are agreed and projects selected within the context of the European Community's Framework Programme.

R&D POLICY IMPLEMENTATION

5.1 The criteria for selecting projects to be funded under EC R&D programmes within the Framework Programme are generally complex. Scientific excellence, progress beyond the state of the art, and novelty, are criteria common to UK and EC research awards alike. EC programmes, however, include many other selection criteria (eg impact on industrial competitiveness, breadth of applications in industry, effectiveness of the project partnership in European/cross-border terms, etc). Scientific excellence, originality, contribution to the development of a scientific field, etc, are in consequence almost irrelevant in the consideration of most EC project proposals (except for the underresourced SCIENCE programme)—but are certainly not irrelevant to scientists.

5.2 We are concerned that the existing programmes of research, geared as they are to achieving a number of EC policy goals, have developed selection criteria that are often long and complicated, and perhaps capable of leading to the selection of projects where the science or engineering research may not be first rate. We do not believe that it is in the UK's long-term interest to encourage such R&D activities if it is not possible either (a) to ensure that scientific excellence is given a higher priority in the selection of projects in all R&D programmes, or (b) to develop programmes where fundamental research has a high priority.

5.3 The principal difference between EC R&D activities supported by the Framework Programme and R&D supported within the UK by the Research Councils is that experienced scientists in the UK are an integral part of the process of determining priorities both for areas of research funding and the selection of individual projects. EC scientific policies are determined in ways that may only accidentally involve the view of UK scientists—such as those at London University—and projects are selected in complex ways (and ultimately by EC Commission officials advised by management committees usually composed of civil servants and other administrators).

5.4 The criteria for the development and prosecution of R&D policies at the EC level inevitably are less dominated by factors that most scientists would consider relevant than for similar policies in the United Kingdom.

Conclusion

6.1 EC programmes of scientific and engineering research to be undertaken within the context of the Framework Programme are growing in importance. Because this growth has to be paid for from within the departmental budgets of government it is to some extent replacing UK research spending.

6.2 The EC's programmes of R&D seem to us to give a lower priority to the importance of scientific excellence because they have additional goals which also have to be met, and in many cases are considered more important.

6.3 The methods by which the EC determines its priority areas for research, and by which it chooses the projects to fund also concern us. In neither aspect do we believe that the EC gives sufficient weight to the view of Europe's experienced scientists and engineers.

6.4 We consider that the time has come to consider the establishment of a parallel programme of fundamental research. This programme should include research in areas of science, engineering and the social sciences.

6.5 The European Community should give consideration to how this might best be established in time for the review of the Framework Programme to be undertaken in 1992.

Memorandum by the Medical Research Council

INTRODUCTION

The Medical Research Council's principal involvement with the EC Framework Programme is through the Medical and Health Research Programme 4 (MHR4). MRC (on behalf of the DES) and DH represent the UK on the MHR4 Management and Co-ordination Committee (CGC) and on the Working Party drawing up proposals for the programme on Human Genome Analysis. These programmes will fall under Line 4 of the new Framework Programme.

Question 1

1.1 The MRC supports the principle underlying the Framework Programme whereby action is taken only where efforts at local, regional and national level do not suffice. European collaboration in certain areas enables:

- more rapid progress to be made in medical research than would be possible with national resources alone
- research to be undertaken of a scale and complexity that could not be undertaken nationally (for example the Human Genome Analysis Programme)
- progress to be made on questions which have an inherently international character.

1.2 Thus, possible areas for the new Medical and Health Research programme have already been identified as:

- (i) Training—to exploit the unique strengths of individual countries.
- (ii) Epidemiology—to exploit the cultural, ethnic and environmental diversity of the European Community to study the interactions of genetic and environmental factors in disease.
- (iii) Health Services Research—studies to identify the most effective methods of health care delivery based upon the differences in clinical practice and health care delivery systems which exist between Member States.
- (iv) Multi-disciplinary teams in areas where local skills are in short supply.
- (v) Multi-centre trials, to permit the recruitment of large numbers of patients for study over a limited period of time—eg in major chronic diseases which naturally follow a variable course and in which clinical end-points are unclear, for the evaluation of expensive technologies and treatments, for the study of rare disorders.

- (vi) Targeted areas such as AIDS, human genome analysis.
- (vii) Adverse drug reaction surveillance and monitoring.

Although there is already significant activity in many of these areas within the UK, they nevertheless offer the opportunity of investing in projects which are likely to provide added value for the UK and other EC Member States so long as they are planned to complement rather than supplant or duplicate existing activities of scientific excellence.

Question 2

It is clear from Annex 2 of the Framework proposal that important areas covered under MHR4 will continue under the new Framework (eg AIDS, cancer, epidemiological studies) and MRC is in agreement with the general thrust of the proposal. An important new development which has been included in the new Framework is the Human Genome Analysis programme, an area where the UK is particularly well placed to play a significant role.

An advantage of so broad an approach is that it allows for an expert scientific input into the detailed drawing up of the programme by the UK representatives on the CGC, thus providing opportunities for ensuring an emphasis on good quality science which will provide added value at national and Community level.

Question 3

The preparation of a new programme allows for the review of the MHR4 programme and realignment of target areas in the new programme in the light of present needs. It also provides an opportunity for bringing to an end projects which have outlived their usefulness but which might otherwise linger on using funds which might be better deployed on new projects.

Question 4

The MRC has seen no need to expand the EC programme in the medical and health field, although current proposals for the new Framework Programme suggest that an expansion is likely. However the process of peer review of proposals insisted on by CGC members ensures rigorous evaluation before funding is agreed. Thus, although the need for an overall expansion of the programme might be questioned, the criterion of scientific excellence ensures value for money.

The possibility that an expansion will result in reduced support for domestic programmes is a very real disincentive.

Question 5

The MRC is not in a position to comment on this question.

Question 6

The Medical and Health Research programme operates by concerted action whereby EC funds for activities such as meetings, short exchange visits and exchange of materials are provided to scientists within the Community whose research is already funded from national sources.

The CGC has managed the programme in such a way as to phase allocation of funds over the full four years of the existing programme. Provided the same philosophy is allowed to continue under the new commitment arrangements there should be no need to hold back a reserve for projects after 1992.

Question 7

The CGC has placed a strong emphasis on evaluation, and scientific quality remains the principal criterion for funding. Members of the CGC have emphasised the need for a continuation of peer review under the new programme and there is no reason to believe that evaluation will not continue to be an integral part of the process.

Question 8

See response to Question 2 above.

Question 9

The stated aims of the fourth Medical and Health Research programme (MHR4) under the existing framework are:

- to promote Community actions in jointly defined research areas considered critically relevant to the solution of major health problems.
- to promote co-ordination of national research policies/strategies through programme implementation by, or in close association with, the competent research organisations of the Member States.

The MHR4 programme does not include either development or "near market" research. Within the medical research field the distinction between basic and applied research presents problems of definition.

However, because the programme has clear targets within defined research areas, and because it depends on scientific priorities, striking an appropriate balance between "basic" and "applied" is not an issue.

Question 10

The MRC strongly supports the view that proposals should be funded on the basis of rigorous peer review. Evaluation of proposals has been an essential element of the MHR programme to date and there is no reason to believe that peer review will not continue to be an integral part of the process under the new programme.

The MRC follows the policy in its own portfolio of research of bringing to an end work which is no longer meeting the required standards of excellence and recycling the funds thus released into new developments. The MRC would wish to see the same policy positively adopted by the CGC of the new MHR together with a more systematic approach to evaluation. The UK is represented on the Evaluation Working Party recently set up by the CGC to review the programme and will be supporting this approach.

A separate evaluation of the MHR programme as a whole is being undertaken within DG XII and is now under way.

Question 11

The MHR4 programme has been broken down into six broad target areas, and within these into a number of sub-targets; the six areas are:

Cancer, AIDS, age-related problems, environment and life-style related problems, medical technology development and health services research.

The mode of action is, however, by concerted action whereby EC funds for activities such as meetings, short exchange visits, and exchange of materials are provided to scientists within the community (and certain COST countries) whose research is already funded from national sources. In this sense the programme supports only reactive research.

It is the view of the CGC, a view supported by the MRC, that this is the most appropriate means of achieving the aims of the programme set out in (9) above. It allows scientists to establish collaborations within the Community based on their own expertise and building on the strengths of Member States, all within an overall framework of objectives laid down by the Community. Development of projects from within the scientific community itself in response to perceived needs is a surer way of ensuring the high standards necessary to retain the credibility of the programme.

Question 12

The MHR programme operates by concerted action. Because the nature of a concerted action is to enable collaboration between scientists and co-ordination of work which is already nationally funded, the possibility of funding research which duplicates research already under way elsewhere in the world does not arise. The actions supported under the programme do, however, allow opportunities for Europe to maximise the contribution that individual member nations can make to internationally scientific research, by pooling of knowledge and exchange of information, and by collaboration on projects requiring the resources of more than one nation.

Question 13

- (a) See answer to Question 2
- (b) The MRC is not in a position to comment on this question.

Question 14

The MRC strongly opposes supporting research projects that cannot be justified on scientific grounds. Commitment to the Framework has financial implications for the domestic research programme which make it all the more important that criteria of scientific quality are applied to ensure value for money and a *juste retour*.

12 December 1989

Supplementary Memorandum by the Medical Research Council

Do you have any comments on the general relationship between Research Councils and the European Commission, as set out in Professor Mitchell's evidence?

The MRC (on behalf of the DES), and the Department of Health jointly represent the UK on the Management and Co-ordination Committee (CGC) for MHR4. The MRC therefore has direct input to EC decision making at most stages, including drawing up proposals for programmes, considering proposals for EC support, and evaluation of programmes and projects. In addition, MRC scientific staff and advisors are amongst members of the UK biomedical community who act as members of COMACs (concerted action

committees) and working parties. These committees assist the CGC in the decision making and evaluation processes.

Especially now that the DES has assumed the responsibility of being the lead Department for MHR4, (the responsibility had previously rested with the Department of Health) the MRC considers that it has a responsibility for informing the biomedical community as a whole of opportunities for funding in the EC. The main mode of support in the MHR4 programme is by concerted action grants, whereby the EC does not contribute to the costs of the research itself, but reimburses the costs of co-ordinating programmes on a European basis.

Apart from MHR4, there are other opportunities for the biomedical community to attain EC funding. In the current Framework Programme, these include programmes in sublines for Radiation Protection, Environment, Biotechnology, Science and Technology for Development, and stimulation, enhancement and use of human resources. MRC involvement in the development, allocation and evaluation of these programmes is less direct than for MHR4.

Do equivalent bodies in other Member States have a similar relationship with the Commission?

Structures of support for medical research vary greatly between European countries, and this is reflected in the different arrangements for representation on the CGC for MHR4 and for input to the Commission. For example:

- *France*: the Director General of INSERM (Institut National de la Santé et de la Recherche Médicale), Professor Lazar, serves as the Chairman of the CGC for MHR4. INSERM is the French equivalent of the UK MRC.
- *Germany*: there is no exact equivalent to the Medical Research Council in West Germany. Responsibility for funding research in universities and institutes is divided between the Federal and the State (Länder) governments, with additional funds from industry and the private sector. A major Federal government health research programme is supported by three ministries, the Ministry for Research and Technology, the Ministry for Youth, Family Affairs, Women and Health (both of which have representatives on the CGC for MHR4) as well as the Ministry of Labour and Social Affairs.

Is there a case for a more formal relationship between Research Councils and the Commission?

As for all the Research Councils, the MRC's formal route to the Commission is via the DES and Cabinet Office. We are broadly satisfied with the existing arrangements. Our submission concerning attribution and additionality, has some bearing on this question.

How successful is the industrial follow through of programmes funded by the Commission both at the national and international level? Do you have any comments on the interface between the Commission and EUREKA?

As explained above, the MRC's principal involvement with EC research programmes is the MHR4 part of the Framework Programme. This operates mainly by grants for "concerted actions", which aim to bring together research groups in different Member States which are doing complementary research, and which are already funded nationally. We cannot therefore usefully comment on these questions.

How can small and medium sized enterprises become involved in research in Europe? Is there a need to set aside some Community funding to encourage research that would strengthen cohesion of Europe? If so, should this come from some source other than the Framework Programme (for example the Structural Funds)?

No comment.

Additionality of Community Funds: how the attribution of such funds can best be handled to preserve domestic flexibility.

The Medical Research Council, understands the fundamental logic of the system of attribution. It accepts that it allows:

- control over government expenditure;
- an incentive to exercise restraint over the total size of European programmes;
- an incentive to win money back to the UK;
- an incentive to ensure that proper systems of assessment and evaluation are established within the EC.

The Medical Research Council strongly endorses Professor Mitchell's concerns about the need for flexibility in the attribution system, in view of the potential impact of EUROPE arrangements on UK funding priorities. The Council would wish to make the following points:

- (1) The Research Councils have limited influence over the total size of the EC's research programme in areas of direct interest to them. The size of the programme is determined essentially on the basis of defining fields of activity (rather than scientific strategies or programmes of work); this broad brush

approach would not be an acceptable basis for determining the funding of domestic programmes. Moreover, there is a strong political component to the decision-making process, which necessarily has to involve negotiation between Member States.

- (2) In relation to the Medical and Public Health programme the MRC plays its full part in defining priority areas for European collaboration, in ensuring rigorous assessment of applications for funding and in pressing for the adoption of appropriate methods of evaluation. However, this does not mean that EC projects always meet the same high scientific standards as projects funded by the MRC nationally, nor that EC projects match UK scientific priorities. The UK is only one voice amongst 12 and so our prime objective is to ensure that the money allocated is spent in the most effective way; there is no realistic possibility within the EC decision-making structure of pursuing the argument that funds should be left unspent on the grounds that the scientific quality of applications does not match that of applications received by the UK MRC.

These factors need to be taken into account in the EUROPE arrangements.

22 March 1990

Memorandum by the Natural Environment Research Council

Question 1

Any European R&D programme must demonstrate the "added value" of having an European as against a national programme (subsidiarity). It is not enough to justify programmes merely in terms of fostering intra-Community collaboration, desirable as this may be. The EC programmes can add value by building up a "critical mass" of researchers; by providing large facilities which would not be available otherwise; and by focusing efforts on specific problems, mainly regional, where resources are necessary for mounting major observational programmes. The latter programmes can also provide the infrastructure essential for the assembly and provision of data (eg from earth observation satellites) and the dissemination of results.

The role of the EC should in particular focus on the following tasks:

- (i) *Co-ordination*: To act as a focal point where there is a clear European dimension to the research area and a need for joint action.
- (ii) *Access to Facilities*: To provide access to facilities or specialist expertise where it is not cost effective for individual countries to generate or purchase such capability.
- (iii) *Support of policy and standards*: To provide for the research needs of the policy Directorates and for setting standards across Europe.
- (iv) *Education and Training*: To stimulate the exchange of students and scientists between countries.

In the area of global environmental research (GER), EC programmes must add value both to national programmes and to the major international initiatives already underway such as the World Climate Research Programme (WCRP) and the International Geosphere-Biosphere Programme (IGBP). These programmes address issues of global significance to which national and regional (ie EC programmes) projects should contribute.

As part of the decision to embark on the present Framework Programme (1987-91), the EC undertook to carry out a review of the objectives and achievements of the Programme during the life of the programme.

This review was conducted by a Review Board of five senior, independent experts, including Sir Geoffrey Allen from the UK. The Review Board recommended a five line matrix for future stages of Framework. The present six lines proposed for the new Framework Programme are broadly in line with this recommendation and represent areas of activity in which EC involvement is appropriate, given the above criteria.

Question 2

The difficulty here is that, while it is desirable to have a detailed programme for evaluation against the proposed financial allocations, it is also necessary to have a broad framework against which detailed discussions can take place so that a scientifically satisfactory programme can emerge. It is important that the Commission takes full account of the views of the scientific community in formulating the detailed programme. The problem is one of procedures and timescales. It would have been preferable for the Commission, following the Report of the Framework Programme Review Board, to have chosen the main programme lines and then embarked on detailed discussion with appropriate organisations within Member States. The proposed timescale for decisions between the publication of the Report in June 1989 and final approval of lines and allocation in December 1989 has precluded such an approach.

Question 3

Yes, this is in accord with the Report of the five independent experts which we support. By having a smaller number of component lines, this should lead to a more coherent and controllable overall programme.

Question 4

The Natural Environment Research Council is not in a position to answer this question as a body which seeks contract research from the EC under the Framework Programme. However, the level of detail provided by the Commission makes the evaluation of appropriate levels of resources extremely difficult.

Question 5

This Council questions the balance between the six proposed lines of Framework. In particular, the Council considers that Line 6—Human Capital and Mobility—to be over-ambitious while Line 3—Environment (accepting the need for the Framework Programme to be subsidiary to both national and international endeavours) should be increased. It is difficult for us to comment on the reduction in Line 5—Energy—although it seems to be surprising given the need to address environmental change research elsewhere within Framework. Within Line 5, a greater emphasis on collaborative work in the disposal of nuclear wastes and in decommissioning nuclear generation plant would be desirable.

Question 6

It is important that a framework for funding over the longer-term is established at the outset in order to provide disciplined forward planning of the research programme and to allow organisations, such as the Natural Environment Research Council, to bid for funding with a structured forward plan. While 1992 may bring about a major change in the operation of the EC, it is necessary to provide for long-term funding to match the long-term nature of the R&D programmes. The proposal for holding a reserve to meet changes to the programme deserves consideration. It could provide some valuable flexibility provided its size did not weaken the proposed new lines.

Question 7

Project management and evaluation are important components within any R&D programme. The Council considers that oversight of Framework Programme Lines and constituent projects should be vested in Management Committees consisting of representatives from Member States. This could be combined with having management contracts placed with R&D agencies in Member States. Both measures would provide a greater control of programmes and the essential integration with national programmes.

Question 8

The new programme remains similar to the previous one. The principal changes are in the re-grouping of projects within the new six programme lines, changes of emphasis within the lines and apparently a slightly greater emphasis on basic research. In terms of justification, the Commission relates its changed programme to the recommendations of the Review Board of five senior independent experts (see 1 and 3 above).

Question 9

It is somewhat difficult for the NERC, as a research funding organisation, to comment on (a) and (c). With regard to (b)—the balance between basic and applied research, the Council has confined its analysis to Lines 3, 4 and 6, with which it is principally concerned.

In the response to question 1 above, the NERC outlined four tasks which the EC should address. One of these, the need for research to support policy and standards, is more applied while the other three tasks focus on basic research.

In Line 3 (Environment), the emphasis is on global processes, regional projects, social and economic aspects of global change, and environmental technologies and engineering. The first three areas of activity can be considered as basic or strategic while the fourth area is applied. This involves the development of new equipment and technologies for pollution control and environmental monitoring. As such, it may also be construed as having "near market" aspects.

Line 4 (Life Sciences and Technologies) has a basic research component (basic biotechnology) while the remaining proposed activities are in the applied part of the spectrum.

Line 6 (Human Capital and Mobility): on the information available, this should be considered as basic research.

Question 10

The Council considers project evaluation to be essential in judging the success and productivity of all research programmes and the EC Framework Programme should not be an exception. The management structure for the various Lines and Projects has to be such as to allow for review and assessment of progress. In evidence above (section 7), NERC proposed that the oversight of projects should be vested in Management Committees consisting of representatives of Member States.

The NERC uses "peer review" in assessing both its own institutes' programmes and those in higher education institutions. In common with other research organisations, NERC is convinced of the value and effectiveness of "peer review" in evaluating scientific research.

Question 11

The role of the EC in funding R&D should focus on a number of tasks ie co-ordination; access to facilities; support of policy and standards; and education and training. To carry out these tasks requires a "directed" rather than a "reactive" approach, with attention focused on specific high priority issues. However, it is important to ensure that within the "directed" funding envelope, applicants are able to apply in a reactive way for support for particular aspects of research.

Question 12

The NERC has already referred (Section 1(a) of evidence above) to the need for European R&D programmes to demonstrate the "added value" of having a European as against a national or even wider international programme. This should be the key criterion in determining whether an EC initiative is justified.

Question 13

It is a concern that there is so little detail within the programme lines of the new Framework against which to assess the validity of the Commission's proposals.

In developing the details of projects, the Commission should take full account of the views of the European scientific community. It needs to develop a better and more open involvement of working scientists in its programme formulation. Failing that, the UK must ensure that the ideas of its scientific community are fed into the Commission at an early stage. Recently, it has become apparent that in the environment area, the Commission is turning to the ESF as a source of advice on basic science programmes. This is to be welcomed as a bottom-up input, also involving the EFTA nations, although it can only represent a sample of scientific views across Europe. It cannot replace the need for strong national inputs in the development of EC programmes. It is also important to ensure that the ESF, although in receipt of EC funding, remains an independent sounding board for the scientific community throughout western Europe (EC and EFTA nations) and with developing links to eastern European countries.

Question 14

The promotion of research co-ordination is one of the roles appropriate for the Commission and figures within the revised Framework Programme. For instance, Line 6 (Human Capital and Mobility) is designed to promote scientific cohesion as recommended by the independent Review Board in terms of "encouragement to the scientific humus of Europe". Scientific excellence should, however, remain a primary criteria for support at least of basic and strategic research.

ADDITIONAL COMMENTS*Priorities and Mechanisms of European Research*

1. In the past, there has been a temptation for the EC to spread its resources too thinly. Priorities need to be critically assessed against the criteria of the need for co-ordinated European action, the priority requirements of the policy Directorates, and the cost-effectiveness of the action proposed. Clear and achievable objectives need to be set.

2. The size and scope of some programmes, such as that on human capital and mobility proposed in the new Framework Programme, are clearly impractical and need revision.

3. The science community is often too remote from the decision making process. There are good examples where the UK community has had a strong influence on EC programmes, but most representation is at the Working Group level which comes into being once overall policy has been defined. Specialist inputs need to be made at a number of stages: policy formulation; identification and preparation of programmes; programme appraisal and approval; programme monitoring; and assessment of results.

4. Although EC funding can be 100 per cent it is usually limited to a maximum of 50 per cent of the costs, with the remainder coming from the Science Budget or from another customer. Hence EC funding usually influences the direction of more research than it supports. This, the considerably bureaucracy involved in the EC application machinery, and the need to expend often considerable energy in finding European partners, has in the past contributed to a lack of interest by some UK scientists in seeking EC support. However, because the Science Budget baseline is reduced to compensate for increases in EC budgets, EC funds cannot be regarded as "extra" money and must be won if they are not to be lost to the Science Budget. This will demand increasing effort and reinforces the need to attempt to ensure that UK scientists have a strong influence on EC priorities.

Impact of European Research

5. In recognition of the future importance of the EC role in R&D, NERC established an office in Brussels in 1984 to represent and promote its interests in Community R&D, to assess the opportunities for contract work and to obtain early intelligence regarding Community programmes. In 1985 the services of this office were extended to the higher education sector on payment of a small fee. In 1987 the other four Research Councils joined with NERC. The Brussels office is now operated on behalf of all five Research Councils and has 54 higher education institutions (HEIs) in membership.

6. The NERC has had considerable experience in dealing with the EC and has generally been successful in winning EC research contracts (see Annex 1). Within the present Framework programme we have been active in seeking to influence the EC in the choice of detailed research topics within the major environmental programmes, Marine Science and Technology (MAST), European Programme on Climatology and Natural Hazards (EPOCH), and Science and Technology for Environmental Protection (STEP), and in co-ordinating the response of the NERC community (including HEIs) to these programmes (see Annex 2). Present indications for MAST, which is the most advanced of these programmes, are that the UK will do very well. We are also actively seeking to influence the Commission on proposals under the new Framework Programme. The Council is acting as the focal point within the Research Councils for the Environment Line of this programme.

7. Our aim is to influence the EC research programme towards our own priorities for European collaboration research rather than for the EC programme to define our national priorities.

8. Government machinery is needed to agree the national stance, with regard to content and size of the EC programmes, to contribute to defining European science policy, to agree the programmes to be carried out and to monitor their execution. The extent to which the environmental science community is involved in this machinery is variable. Research Council inputs have been sought on the new Framework Programme but all too frequently requests for advice are made in an *ad hoc* way and without sufficient time for consultation. Feedback is also poor.

December 1989

ANNEX 1

Title	Duration	Amount/Inst
Development of Advanced Interactive Computer Modelling Techniques for Multicomponent 3D Interpretation of Geophysical Data	4-87 3-90	130,000 BGS
Direct Indication of Hydrocarbons by Airborne and Ground Magnetic Survey	1-87 12-89	154,800 BGS
Consultancy (Dr Edmonds) on Research and Development in the Fields of Non-Nuclear Energy	1-86 12-89	225,000 ECU BGS
Hydrothermal Fluid Anomalies: A New Strategy for Geochemical Exploration	10-87 1-91	180,000 ECU BGS
Comparative Study of Metallogeny Related to Granite-Sediment-Fluid Interactions and Lineaments in the Caledonides and Hercynides	10-87 3-90	130,000 ECU BGS
Transfrontier Research in Low-Seismicity Areas	9-87 8-90	572,100 ECU BGS
Location of Cavities Using Geophysical Methods	2-88 1-90	87,519 ECU BGS
Molecular Mechanism of Cell Injury and Toxicity in Marine Molluscs	1-86 12-89	71,400 PML
The Role of Surfaces in the Transport of Radionuclides in the Marine Environment	7-85 12-89	75,600 PML
Physiological and Biochemical Approaches to the Assessment of Pollution of European Estuarine and Coastal Ecosystems	1-88 12-91	90,000 ECU PML
Environmental Structure and Tropical Conditions in Relation to the Survival and Recruitment of Pelagic Fish Larvae	12-87 11-90	31,050 ECU PML
Migration of Uranium Daughter Radionuclides in Natural Sediments	10-87 3-90	92,000 ECU IOSDL
Aquatic Ecotoxicity and Speciation of Aluminium Chemical Reactions	1-88 12-89	93,000 ECU IFE
Risk Assessment: Field Release of Genetically Manipulated Baculovirus	4-87 12-89	124,600 ECU IVEM
Baculovirus Expression Vectors; Bluetongue Virus Vaccines; Rabies Virus Vaccines	7-86 12-89	98,900 IVEM
Tree Stability and Form	1-88 6-90	60,000 ECU ITEN
Early Diagnosis of Forest Decline Associated with Atmospheric Pollutants	7-87 6-91	173,800 ECU ITEN
Studies of the Effects of Pollutant Gases and Acid Mist on Young Trees in Open Top Chambers and an Investigation of Chamber Properties	9-87 8-91	142,300 ECU ITEN
The Relationship between Soil Organic Matter and the Actinide Elements	1-88 12-89	29,300 ECU ITEN
Evaluation of Data on the Transfer of Radionuclides in the Foodchain	1-88 1-90	180,000 ECU ITEN

<i>Title</i>	<i>Duration</i>	<i>Amount/Inst</i>
Liming and Fauna Inoculation to Ameliorate Acidification due to Air Pollutants	4-88 12-91	62,630 ECU ITEN
Development of Deep Ocean pH Instrument	8-88 7-90	19,490 ECU IOSDL
Mechanisms of Nutrient Turnover in the Soil Compartment of Forests	11-88 11-91	500,000 ECU ITEN
High Resolution Studies of Mid-Oceanic Ridges	12-88 12-89	56,440 ECU IOSDL
Complexation of Radionuclides with Naturally Occurring Compounds in Groundwater	12-88 12-90	214,000 ECU BGS
The Accumulation and Effects of Atmospheric Particulates on Forests	4-87 3-90	65,653 ECU ITES
Models and Data to Predict Radionuclide Concentrations in Freshwater Fish after Atmospheric Deposition	12-88 6-90	110,400 ECU IFE
Mechanisms and Theoretical Basis Governing the Creation and Development of Borhole breakouts	10-88 4-90	50,000 ECU BGS
Scientific Co-ordination of Corine Programme Specifically Related to the Corine Technical Steering Committee and of the Corine Land Cover Team	12-88 12-89	42,750 ECU ITES
Monitored Environment Release of Genomically Tagged Phylloplane and Rhizosphere Bacteria	1-89 1-91	122,100 ECU IVEM
Risk Assessment of the Field Use of Genetically Engineered Baculoviruses and Plants	1-89 1-91	70,000 ECU IVEM
Esprit Project: 2316 Multisensor Image Processor (MUSIP)—Co-ordinated by Marconi Space Systems	1-89 1-91	106,000 ECU COUN
The Modelling and Dynamics of the Quaternary Geology of the Southern North Sea and their Application to Environmental Protection and Industrial Development	4-89 4-91	1,457,760 ECU BGS
The Ecological Research on Catchments in Europe: State-of-the-Art and Prospects	1-89 1-90	15,000 ECU ITEN
Corine Biotopes Project: Continuous Development of the Corine Biotopes Inventory	5-89 5-90	180,000 ITES
Measurements of Dry Deposition Fluxes of NOX1, Pan and HNO3 over Several Soil Types	6-89 6-91	297,000 ECU ITEN
Daily Assessment of Literature in Aquatic Environment	7-89 7-90	90,450 ECU PML
Application of Weather Radar to the Alleviation of Climatic Hazards	9-87 10-91	99,600 ECU IH
Preparation of River Sediment containing Permethrin and a Stability Study	7-89 12-90	12,000 IFE
The Use of Selective Viral Pesticides against Five Key Pest Genera on Nicaraguan Food Crops	11-89 5-92	192,200 IVEM

Notes:

The start/end dates show the month and year.

Amounts shown are in £ sterling unless indicated as in ECUs.

Key to Institutes:

BGS	—British Geological Survey
PML	—Plymouth Marine Laboratory
IOSDL	—Institute of Oceanographic Sciences, Deacon Laboratory
IFE	—Institute of Freshwater Ecology
IVEM	—Institute of Virology and Environmental Microbiology
ITEN	—Institute of Terrestrial Ecology (North)
ITES	—Institute of Terrestrial Ecology (South)
COUN	—Council: NERC Scientific Services
IH	—Institute of Hydrology

NERC INVOLVEMENT IN DGXII PROGRAMME DEFINITION

MAST (Marine Science and Technology)

The Department of Education and Science (DES) is the lead Department for MAST. The development of the Programme has involved an extensive consultation period (nearly a year) between the Commission and Member States. In the UK, a Whitehall Working Group on Marine Science and Technology was established under the chairmanship of DES and with representatives from NERC (also representing SERC), DoE, MAFF, DTI, Cabinet Office etc. This provided a forum for the various stages of development of the programme to be discussed and for formal briefs to be prepared for the UK Representative in Brussels and for UK delegates attending CREST *ad hoc* working group meetings on the programme.

Views were sought from NERC scientists on many occasions on the programme and the proposed priority lines. These were then incorporated into briefs or were the subject of discussion at meetings in Brussels. This mechanism has allowed the UK to have a satisfactory input to the development of the programme. Perhaps equally importantly, it has also greatly facilitated NERC in offering advice and guidance to the wider UK community interested in the programme. This culminated in an open meeting organised by NERC in March 1989 for all potential applicants at which a whole range of issues were discussed. Commission representatives gave presentations at the meeting and were able to clarify a number of grey areas for the 150 scientists who attended.

Contact points for the MAST Programme were established in each Member State to act as a focus for queries and the dissemination of information. Additionally, scientists from NERC laboratories were co-opted onto working groups etc by the Commission in the earlier stages of definition of the programme and in determining requirements in specific areas of the programme.

In summary, the MAST experience has been a positive one. The Commission have tried their best to involve Member States throughout the development of the programme and the UK has taken full advantage of this. The closing date for submission of MAST proposals was 30 June 1989. These have now been reviewed by the CEC MAST Advisory Committee and announcements of awards are anticipated shortly.

STEP (Environmental Protection) and EPOCH (Climatology and Natural Hazards)

The Department of the Environment (DoE) is the lead Department for both programmes. NERC scientists have made some inputs in the early stages of the definition of these programmes through membership of Commission working groups etc. Both programmes are now at the stage of receiving proposals.

STEP in particular ranges over many areas of NERC science, covering the following nine broad research areas: environment and human health; assessment of risks associated with chemicals; atmospheric processes and air quality; water quality; soil and groundwater protection; ecosystem research; protection and conservation of the European cultural heritage; technologies for environmental protection and major technological hazards.

Its main objective is the provision of scientific and technical support for the environmental policy of the Community, and for other relevant Community policies such as energy, agriculture, industry, aid to developing countries, both for the solution of short term policy questions and for the medium and long-term formulation of preventive and anticipatory policies.

EPOCH has a similar main objective to STEP and four research areas: past climates and climate change; climate processes and models; climatic impacts and climate related hazards; and seismic hazard. The Meteorological Office has generally provided the main support to DoE on the Climatology Programmes but NERC has also been involved. NERC scientists have also been directly involved in discussions on the natural hazards part of the programme.

Supplementary Memorandum by the Natural Environment Research Council

(i) Do you have any comments on the general relationship between Research Councils and the European Commission?

In our earlier evidence to the Committee we emphasised the importance we attached to the Commission consulting widely with and taking full account of the views of the European scientific community in developing its plans for R&D. Similar close collaboration is needed in assessing research proposals, monitoring progress and evaluating the outputs and overall success of the EC R&D Programme if scientific excellence is to be ensured.

The Commission has tended to develop these links at an individual working scientist level rather than formally through national bodies such as the Research Councils. Thus several NERC institute scientists and members of the higher education community supported by NERC have been involved in programme definition through membership of expert Working Groups and the like.

More formal links between the Commission and Member States tend to be at Departmental or Cabinet Office level through their membership as national representatives on the Programme Management Committee and CREST (Scientific and Technical Research Committee). The Committee for the European Development of Science and Technology (CODEST) provides a direct input from the European scientific community but at a very senior level and on an *ad hominem* basis.

The Research Councils provide briefing to the UK representatives on these more formal structures. However, the timescales allowed are often so short that proper consultation with the research community is difficult if not impossible. The problem is mainly with the late availability of paperwork from the Commission with insufficient time allowed between circulation of papers and meetings.

Since our earlier submission the NERC has become directly involved in the Programme Management Committee dealing with the Environment line for the Framework Programme. Thus we now have input at this level on our own behalf. We also carry briefing from the other Research Councils to these meetings.

At the same time as inputting to programme definition etc., the Chairman and Secretary of the Council have met with senior Brussels officials and the Council is encouraging the research community in its own institutes and the higher education sector to take the initiative in interacting productively with the Commission.

Our earlier evidence referred to the role of the UK Research Councils' European Office in Brussels in promoting UK participation in EC research programmes by alerting researchers to the opportunities available. This Office not only serves the Councils but also provides a liaison, advice and contact point for around 55 higher education institutions. The Office personnel are in regular contact with Commission officials. They provide up-to-date information by means of a regular Bulletin covering latest information from the Commission and others on research programmes, early warning of research initiatives, anticipated timescales etc.

The Research Councils (and others) have also organised several meetings for the wider dissemination of information on EC R&D programmes, to the UK community, involving Commission officials in these meetings.

(ii) Do equivalent bodies in other Member States have a similar relationship with the Commission?

We have no knowledge of any formal links between equivalent bodies in other Member States and the Commission but know that several of them are very active at an informal level.

We believe that the UK, through its Research Councils' European Office, is probably one of the most advanced in terms of diffusing information on EC R&D to its research community.

The French have a small Office in Brussels, the Dutch have an EC Liaison Office based in The Hague. As far as we are aware the Germans have no equivalent Office in Brussels.

(iii) Is there a case for a more formal relationship between Research Councils and the Commission?

We share Professor Mitchell's view that it is likely that the Commission would not wish to appear to lose their independence by tying themselves formally with individual bodies in the Member States.

However, all possible steps should continue to be taken to encourage the Commission to recognise the Research Councils both jointly and individually as a source of expertise and advice on UK involvement in EC programme development, and also as potential managers on behalf of the Commission for distributed programmes.

Rather than relating solely to Member States individually, DGXII of the Commission does now appear to be developing a more formal relationship with the European Science Foundation (ESF) in certain areas. We referred to this in our earlier evidence, welcoming it as an additional bottom-up input also involving EFTA nations, but emphasising that it should not be seen as replacing the need for strong national inputs through informal and existing formal links between Member States and the Commission.

The ESF is an association of its 50 member research councils and academies in 18 countries and brings European scientists together to work on topics of common concern to co-ordinate the use of expensive facilities and to identify new areas for co-operation. EC/ESF links are being developed particularly in environmental areas with the recent establishment of two joint Committees—the European Committees on Ocean and Polar Sciences (ECOPS) and the Advisory Panel on Environmental Change (APEC). Both of these Committees have a role in advising on future directions for basic research. The NERC Director of Marine Sciences and the Director of the British Antarctic Survey are members of ECOPS and therefore have a direct input to Commission thinking via this route. There is at present no direct NERC input to APEC although the Committee is chaired by a former Chairman of NERC (Sir Hermann Bondi) and one of its members (Professor O'Riordan) is a member of the ESRC research community.

(iv) How can attribution of Community funds best be handled to preserve domestic flexibility?

The NERC shares Professor Mitchell's concerns about the possible future effect of attribution on the Science Budget with its implications of constraint on freedom to determine our own scientific priorities that this could entail.

If we are to secure, from the EC, monies which have been taken away from the Science Budget under our system of attribution, we could be faced with having to bid for support in research areas determined by the Community but which we might not consider as of the highest scientific priority for support. In such an event the position would be compounded since EC support is never 100 per cent of full cost of the project and Science Budget money would need to be injected to top it up. There is therefore a double jeopardy situation—loss of Science Budget under attribution and "loss" of Science Budget money in topping up EC supported projects which may not be of the highest scientific priority.

It could be argued that the answer to this is for us to ensure that our inputs to the development of the EC programmes are sufficiently strong to ensure that their priorities coincide with ours, and that we will therefore not be faced with the possibility of having to adopt double standards. This is indeed the line that we are developing in relation to the third Framework Programme and which we have already used to some effect in the second Framework Programme. However, we are just one voice in twelve round the table. Other countries have different interests and priorities and the success of this approach cannot be guaranteed.

As the EC R&D budget continues to grow and it becomes increasingly concerned with basic science, attribution to the Science Budget could lead to a significant reduction in our freedom to deploy funds to the best advantage. In such a situation we would look to the Department of Education and Science to bid for re-instatement of funding. If this were unsuccessful, high priority domestic programmes would inevitably have to be cut.

Letter from Mr Madron Seligman MEP

I reply to your letter of 7th November, 1989, I would like to make the following comments in reply to your questions concerning the R&TD Framework programme, as seen from the European Parliament's Committee for Energy, Research and Technology.

How far is a European programme for R&D desirable at all?

A European Programme of R&D is desirable for the following reasons:

- (i) By pooling resources with complementary European counterparts, small and medium sized companies can tap into a wide range of disciplines, which they could not otherwise afford. One company put the ratio at 8 to 1.
- (ii) Even the Basic R&D should be market-oriented in the long term. The fact that Community projects aim to satisfy a European-wide market potential, means that the eventual application of the results of research are more likely to meet the needs of the Single European Market, than research limited to the market of any single nation.
- (iii) The objective of the Single Market is to elevate the economy of the less wealthy members of the Community by joint R&D. This is in all our interests.
- (iv) Single member nations working within their own Scientific Resources, will find it difficult to make the sort of progress the USA and Japan achieve. Some International Scientific collaboration, such as CERN clearly takes place effectively outside the Community R&D Framework programme. But much of it consists only of periodical conferences and reading each others' literature. It lacks the dynamic management, which DGXII and DGXIII have been able to supply to many of the projects in the Framework Programme. I have the evidence of a number of British companies whom I have contacted, to confirm this. These companies testify to the advantages of sharing in cross frontier research, in sharing the risk and the cost, Courtaulds spoke of a project which would never have taken place without EC Funding. Some do, however, complain of inflexibility.
- (v) In view of the growing shortage of innovative scientists, it clearly makes sense to pool these resources between member nations. JET, CULHAM is a case in point.
- (vi) If the EC does not improve and increase its basic research we shall become a demand dominated economy, importing and not manufacturing.
- (vii) The fact that all programmes are heavily over-subscribed shows that these programmes are needed.

Which are the areas where collaboration between the Community and Member States will be most beneficial?

- (i) The Community's R&D Framework Programme should be strictly limited to basic and pre normative and pre competitive research.

This is an area which is more expensive and more speculative and less likely to attract private industrial shareholders. If the State does not do this research, or at least help it, no-one will do it.

Industry should be responsible for the closer-to-market research under such schemes as EUREKA.

Where the Framework gets involved in EUREKA in a sort of hand-over capacity, its financial contribution should be strictly limited and attenuated.

- (ii) The areas of collaboration should be those which are relevant to the Community's principal problem areas, areas where the Community and the developing world, which the Community fosters, stand to benefit most.

These are:

1. *Industrial Manufacturing* competitiveness which will help to solve the high unemployment—particularly in Spain. Rejuvenating traditional industries is recommended by the five wise men.
2. *Communications and Information Technology*, which greatly affect our ability to compete in the world.
3. *Energy*, which is rapidly running into a situation where coal and hydrocarbons, nuclear power and renewable energies are all unacceptable for environmental safety or economic reasons.
4. *Material Technology*, because at the rate we are going, the next few generations will have totally squandered the basic materials which contribute to our soaring standard of living.
5. *Fundamental Environmental Chemistry, Physics and Biology*. I would like to see basic research in the cracking, conversion, or absorption of Carbon Dioxide and other Greenhouse gases before they reach the upper atmosphere.
 Co₂ is absorbed by plants through photosynthesis connected with Chlorophyll. Could scientists replicate this natural process, artificially?
 Would it be possible to pass exhaust gases from power stations through very cold water, which absorbs Co₂!
6. *Basic Science* to help *mitigate congestion* on the roads and in the air by sophisticated navigational aids and traffic controls.
7. Basic Science to reduce the extended *half life of nuclear waste*—actinides, etc. by mutation in fast reactors.
8. As more and more infectious diseases are eliminated by anti-biotics, we are left with structural diseases—diabetes, sclerosis, heart disease, cancer etc. Biotechnology must be harnessed to solve this type of disease.

Are the six areas identified for Commission support the right ones?

Clearly the EC has no reason to get involved in defence oriented research. (The fact that Britain, France, the USA and Russia have devoted a large part of their scientific resources to defence, has left the field of market-oriented research largely to Japan, the Far East and Germany, who now dominate many markets, such as motor cars and electronic goods).

The Commission, in concentrating on non-defence science, has started to redress this balance, albeit with only 2 per cent of the R&D expenditure of the EC at its disposal.

I consider their choice of six areas to be the best ones at the present time. Flexibility must, however, be maintained, in order to take on new areas, as and when they become relevant. The crumbling of the communist monolith will undoubtedly reduce western defence research expenditure and call for a change in the emphasis of all research programmes during the next few years, from "swords to ploughshares".

What value is such a vague Framework Programme?

The Commission clearly wishes to retain for themselves the maximum flexibility of choice, by keeping the project areas as broad and vague as possible.

The European Parliament's Energy Committee, however, is going to ask for these six headings to be amplified into 16 subheadings, and will make recommendations on how these should be weighted and financed.

In fact, these 16 subheads follow closely the more detailed statement in the Annex II, of the Commission's proposal.

If the Council need even more detailed information—for purposes of control, they should read all the specific proposals for programmes such as RACE, BRITE, AIM, ESPRIT, DELTA, EPOCH, STEP, SPRINT, etc.

There is no shortage of detail if the Council need it.

Nevertheless, the Commission have rather overdone the vagueness, in order to keep the maximum number of projects subject to qualified majority voting in Council as opposed to unanimity and the veto.

Nevertheless, Framework II was unjustifiably diluted and spreadeagled over 37 separate projects. More concentration is essential in Framework III.

Is the Commission right to propose a new Programme rather than revising the existing programme?

The Commission justifies the new programme as the logical product of the Mid-term review of the Framework II programme.

If one accepts that the more R&D that is co-ordinated on a Community basis, the better, one cannot object to the Commission's effort to add the new five year 1990–1994 Framework III programme onto the back of the current 1987–1991 Framework II programme. By this proposal, they are really asking for a

10.8 billion ECU Framework III programme, against a 5.4 billion ECU Framework II Programme. (From 1990 to 1992, 3.1 billion ECU will still exist from Framework II and on top of that 2.7 will come in for Framework III, leaving 5 billion ECU for Framework III to come in in 1993 and 1994).

I am sure that sufficient relevant R&D exists to justify the 10.8 BN ECU; but I personally have not heard a detailed justification of how it would be spent, other than in amplifying the work started in Framework II. What will be new?

An annual review and roll-over programme would have been preferable, and I have proposed an amendment to this effect. Chiabrando's amendment No 16 also deals with this point.

This would have made it easier to dovetail into the periodical budgetary reviews of the Inter Institutional agreement.

Has the Commission adequately justified the resources to be made available?

No. But the fact that the proposal follows very closely the recommendations of the five wise men, headed by Sir Geoffrey Allen, gives some reassurance that the programme is well orientated. The cost of scientific R&D is rising sharply.

Some savings could be made by removing some projects which appear to be too close-to-market. That is why early scrutiny and selectivity is desirable.

Is the balance of funding between the areas correct? In particular, is the Commission right to reduce support for projects concerned with Energy?

- (i) No. Provided it does not go too far, I support Chiabrando's reallocation and increase of the money devoted to the 16 areas, the effect of which is to reduce the large sums devoted to Information and Communication Technologies and to Manufacturing Technologies, which are sufficiently well launched to look after themselves.

He has substantially increased the sums allocated to Environment, Life Sciences and Energy, where Community expenditure is more likely to be more marginally cost effective at present.

- (ii) We must, however, beware of the new policy of European Socialists to condemn anything to do with increased competitiveness, and to concentrate instead on environmental and risk reduction policies.
- (iii) As I said in 1(b)ii, energy, though cheap and plentiful at present, is rapidly becoming unacceptable for various reasons. If we are going to avoid terrible environmental developments, a lot more research has got to go into making present energies acceptable and finding economic ways to use acceptable energies, such as hydrogen, nuclear fusion, photo-voltaic and biomass energies, and to reduce the unacceptable inefficiency in energy consumption (ie wasting Kilowatts).

The Framework III Programme covers five years (1990-1994 inclusive). The tail of Framework II covers three years (1990-1992).

While we are subject to the present Inter Institutional Agreement envelope, the programme will have to be revised before 1993 and 1994 expenditures are agreed.

However, there is a strong demand for the IIA to be on an annual roll-over basis.

The Dutch proposal in the Council of Ministers to set aside a substantial reserve in 1993 and 1994, is, in the circumstances logical, and should be accepted by HMG.

The Articles of the Proposal certainly do not stress the need for independent evaluation; particularly prior to the review at the end of the Third Year of Framework III.

However, the Commission has developed a very comprehensive evaluation system using outside experts. I am confident this practise will apply in the case of Framework III.

I have submitted an amendment to Framework III articles calling for an end to departmental attribution of all EC Financial grants. The attribution is a major disincentive to participation in useful joint Community research.

While it may have an accountancy logic, it is ridiculous to create a disincentive to the receipt of EC shared cost contributions to our own industries and universities, which is a way of getting back the 38 per cent of the cost which we are obliged to contribute as a nation, whether we participate or not in the research programmes.

MADRON SELIGMAN
29 November 1989

Letter from Professor H C A Hankins, Principal of UMIST

Thank you for your letter dated 2 March 1990.

The question of additionality of Community funding is a very important one to us in the HEIs. We of course wish to have opportunities of undertaking complementary research from sources other than from the UK research councils and industry direct. The European Community programmes provide such an opportunity, however, as illustrated in Professor Mitchell's evidence, there are a number of disadvantages for the UK HEIs in assessing these funds, which as a result means that additionality is not always achieved. The major issues are:

- (a) High competition.
- (b) Requirements for particular trans-border partners.
- (c) Lack of formal influence on the announced programmes of research.
- (d) Very detailed administrative procedures.

UMIST is successful in obtaining funding from the European Community and is a member of the UK Research Councils' Club in Brussels. It has decided to be more active in selling itself in Europe, through the activities of its marketing company (UMIST VENTURES Limited). UMIST has been particularly successful in areas where there has been a much greater influence by the UK Government on EC research areas of interest, eg the field of Information Technology, in which UMIST has recently been awarded £540K under the ESPRIT programme. Whether the other areas in which UMIST has been successful also coincide with the priorities of the UK Research Councils has been more a matter of individual "luck" with particular projects rather than achieving pre-determined aims for desired additionality.

The final point I wish to make is related to the aspect of working with other national companies and HEIs. There is no doubt that UMIST has experienced much greater collaboration with other EC countries as a result of the EC programmes, but it is much more difficult to say if this has led to more effective research and intellectual property exploitation, than if it had all been undertaken in the UK with, say, a partnership of ourselves and one industrial organisation. Our general experience is that quite often the problems associated with working with other countries often leads to lack of effective progress. The evaluation procedure seems not to have really been able to address this, in other words, it is not clear if the EC can properly evaluate success, since often the initial objectives are not well defined in this regard.

I will be responding to your list of detailed points, as requested, by 9 April and this will give you further information in support of my comments above.

H C A Hankins
20 March 1990

ANNEX 1

UMIST

RESEARCH GRANTS AND CONTRACTS

Commission of European Communities

Based upon research contracts originating during the periods 1983-84 to 1989-90 inclusive, the EEC funding details are as follows:—

Chemical Engineering

Energy recovery and waste treatment by anaerobic biofiltration	£81K, Recycle of Urban Waste
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Computation

Rule-based representation of information system constructs	£207K, Esprit
Multi-method approach for developing universal specification	£83K, Esprit
Advanced integrated circuit design aids	£456K, Esprit (NB Sub-contracts to ICL)
An intelligent, adaptive, information retrieval system as Hospital Information System front-end	£36K, Aim
Application specific architecture compilation	£74K, Esprit
Integrating database technology, rule-based systems and temporal reasoning for effective software	£540K Esprit

Control Systems Centre

Human centred GIM systems	£64K, Esprit
Development of techniques for fault detection in complex systems	£82K, Stimulation

Self-tuning methods for plasma control applications	£25K, [NET Agreement]
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<i>Corrosion and Protection Centre</i>	
Effect of gaseous atmospheric pollution on degradation of building materials	£23K, Environment
Modelling of erosion—corrosion processes in energy conservation systems	£74K, Energy Conservation
Air pollution and environmental factors in historical building decay and protection	£278K, Environment
<i>Electrical Engineering</i>	
Concerted European action on magnets	£60K, Stimulation (Scientific Co-operation)
<i>Languages and Linguistics</i>	
Development of a common reference terminology dictionary for demonstrator programme on materials data banks	£102K, "Mat-Term"
Multilingual terminology for materials databanks—maintenance, updating and planning future developments	£36K, "Mat-Term 1A"
Implementation of the experimental assembly of the EUROTRA software	£120K, Study Contract
Completion of the Eurotra software specifications	£91K, Study Contract
Machine translation system of advanced design	£267K, "Eurotra"
Systems specifications for EUROTRA	£60K, "Eurotra"
<i>Materials Science</i>	
Thermal diffusivity and conductivity of fibres and microstructural examination of the composite materials	£113K, Brite
<i>Biotechnology Centre</i>	
Automation of DNA sequencing for genomic charting	£104K, Biotechnology Action Programme (NB originally DIAS)
Sequencing yeast chromosome III—DNA resources co-ordination	£64K, Biotechnology Action Programme
Sequencing of chromosome III—Co-ordination of molecular resources	£132K, Biotechnology Action Programme

Letter from Professor H C A Hankins, Principal of UMIST

Further to my recent communication in response to your letter dated 2 March 1990, I am pleased to give you my further comments which represent the UMIST view about other aspects of the Framework Programme.

I have used the same numbering of paragraphs as used in your original letter.

Question 1

We believe that European programmes for R&D are desirable provided they meet the following criteria:

- (i) They are complementary to national programmes so there is continuity of purpose behind EC and national/regional activities.
- (ii) That by targeting optimum use of both EC and individual Member States there is added value/synergy on a European scale.
- (iii) There is awareness of the need for, and the benefits to be derived from EC programmes, ie competition or co-operation with Japan and/or the US.
- (iv) That all programmes are seen to be genuinely European in fact, rather than in concept.

The areas of co-operation are broadly right, but we should like to see more in the fields of Environmental Technology, Life Sciences (including biotechnology), Computerised Linguistics (for automatic inter language communication) and the whole topic of recycling of manufactured goods, for the benefit of energy saving and materials preservation.

Questions 4 and 5

We think that as far as it is reasonable to expect, the EC justifies resources and funding balances.

Funding size is always going to be a political question and there is no guaranteed way to ensure fair and reasonable distribution of funds. However establishing clear justifications for programmes is important, and a system of priorities may also be useful provided it is seen to be fair to all Member States.

Question 6

It is vital to establish funding NOW, to establish the basis for operating in advance of 1992–93. Adjustments and/or additions to both programmes and funding will occur anyway but the operating system needs to be in place to give everyone the maximum time possible, to understand the system of participation.

We also believe that the idea of a reserve fund in anticipation of new projects is a good one.

Questions 9 and 11

We do NOT think the Commission is at all clear about its priorities or what it is trying to achieve with regard to basic or pure and applied research and development.

Guidelines are often confusing, so that the BRITE/EURAM programme for example, seeks to establish "pre-competitive" research, but often gives confusing information about whether this should be directed basic research or development. At the same time as it emphasises pre-competitive, it promotes the need for near market, applied work, which causes confusion about what is really needed.

The latest BRITE/EURAM programme is helpful to HEIs in that it sets out Type 1 and Type 2 projects, which clearly differentiate between fundamental and applied research, and so avoids any confusion. This type of clarification, coupled to some system of prioritisation would help the whole process, and enable everyone to be more focussed in applications and programmes.

A lot more effort is needed to clarify objectives and define priorities in all areas.

Questions 7 and 10

Evaluation MUST become an essential element in EC research programmes to establish quality, time scale and value for money, as well as standards of reporting. It is our view that the Commission does NOT have sound criteria or procedures for project evaluation. This contrasts sharply with the assessment system for granting projects.

We believe that the directness of current and future programmes is not as effective as it should be because of the lack of an appraisal system with measurable criteria. This is an important topic for review and improvement, which is both acceptable to HEIs and where they can make a very positive contribution, since peer review in academia is common practice.

Question 12

Where clear political, social or economic justification is established, the Commission must support research to strengthen Europe's competitiveness, and its ability to maintain market share in important industrial sectors which are fundamental to the EC's economic and political security.

The issue is one of balance, where research into such basic areas is also countered by a large percentage of the budget being devoted to new areas which will enable the EC to lead or build strategic partnerships from a position of technological strength. Europe must be innovative for this objective to be achieved.

Question 13

Details of projects should be settled as far in advance as possible in order to give all interested parties the best opportunity to present the best resources to the Commission. This highlights the need for effective "networks of excellence", who can respond to projects internationally, with both the right HEI and industrial input. Increasingly these must be multi-disciplinary with global awareness of the needs of society. This is especially relevant in areas like environmental technology, biotechnology and even all areas of transportation (including automotive, marine, rail and aerospace research).

Starting new projects without political backing is no problem, provided that funding is not withdrawn once these projects receive full political backing. There seems to be a logical justification for having continuous project funding in areas such as those nominated above, since there is a clear justification for continuous research on transport and environmental issues, and these are fundamental to the economic and social structure of the EC.

Question 14

There are a number of key issues involved in the answer to this question.

- (i) Without project support for topics which strengthen economic and social cohesion of the Community, there will be fewer SMEs.
- (ii) Equally the growth of SMEs is a function of new technology.
- (iii) We feel it to be very important that the Commission gives emphasis to projects with a high degree of scientific and technology transfer for commercial exploitation.
- (iv) The results of such projects along with programmes like ERASMUS, COMETT etc. will bring about social cohesion.
- (v) SMEs originate from the process of technology transfer but are great sources of innovation, being flexible, and MUST be encouraged to participate in as many programmes as possible.
- (vi) We should favour more financial support from the EC for SMEs than for large corporations in order to encourage and stimulate participation and collaboration.

We feel that help with administrative, financial and contractual aspects of being involved with a programme will act as an incentive to SMEs instead of as a deterrent, which is currently the position. There

is no doubt that SMEs can make a significant contribution to programmes, not only in terms of innovation but also in terms of quality, scientific and technical excellence as well as flexibility.

The whole area raises the question again of effective international networking between HEIs, SMEs and large corporations, all of whom have a real contribution to make. However, all are constrained either by resources, the lack of international perspective or bureaucracy and administrative difficulties.

Application Procedures

The application procedure is both complex and time consuming. A system of pre-screening of proposals or with a short time response on whether or not an idea is worth progressing to a full proposal, would be really helpful. Many potential participants are not aware of the informal advice available or are deterred by administrative procedures. Centres of personal advice, especially geared to SMEs would help a lot.

The concept of large companies acting as group or network project leaders on an international scale could help participation by HEIs and SMEs with encouragement and administrative help.

Programmes of seminars in say, four regional centres on Community funding of R&D, and how to find and work with partners in making applications would be helpful.

At UMIST we are adopting a proactive role in finding industrial and academic partners throughout Europe for joint participation in EC projects. In addition to which we are trying to sift relevant information on EC projects and programmes, and direct them to relevant departments and/or individuals who could be interested. A copy of our latest internal news brief on the BRITE/EURAM programme is enclosed (*not printed*). We believe such a system could be used nationally and internationally to improve the capability of HEIs, SMEs and large corporations to participate in EC programmes.

I hope you will find these thoughts to be helpful and if you need any further information, please contact me again.

H C A Hankins
Principal
12 April 1990

Letter from the Provost of University College London

Thank you for your letters of 2 and 6 March.

I don't feel able to make much contribution to Sub-Committee B's deliberations, but will do my best.

A. *Additionality*

If I interpret that as the question as to whether UK financial contribution to the European programme should be additional to, and not subsumed into the UK domestic science vote, then my answer would be yes. The dangers of the alternative are, as set out in Professor Mitchell's evidence, a distortion of the UK science community's priorities. This is not just an expression of concern about loss of (scientific) sovereignty, but results from the fact that the UK science community suffers under greater financial restraints than is the case in other parts of the Community and has, therefore, to be particularly concerned with the impact on the science programme priorities of the twin squeeze of financial pressure and the related educational imperative.

B. *Other Questions*

1. It is important not to confuse *research* and *development* under the heading "R&D". Development is the area for industrial logic and company policies to decide. Research—and most certainly basic research and strategic research is the area where the universities have the prime role. It would be stupid to suggest that a European programme on basic and strategic research is undesirable. It would be equally stupid to suggest that there should be no complimentary (and mutually consistent) UK programme. It is a question of balance.

The choice of the six areas seems very sensible to me—and all should benefit from a Community approach. I find it impossible to comment on the relative allocation of resources, because there is inadequate data available to enable one to judge whether the human and other resources are available to enable the funds to be spent. In terms of relative importance, the balance seems sensible to me.

4 and 5. By and large, yes.

6. There are two points which need to be taken into account:

- (i) In some areas of research, the work shouldn't be embarked upon unless there is a commitment to "stay with it" for, say, 10 years;
- (ii) There must be enough flexibility financially for a rolling annual review to modify, add to and delete from the objective of programmes defined at time zero.

9 and 11. My guess is that the answer is generally "yes" and that they will behave sensibly.

7 and 10. Evaluation is important if it is conducted at the right time—not, say, one year into what should be a two-year programme.

Judging by the ESPRIT review, the Commission does have adequate procedures.

On "peer review" I have yet to hear of a better (or even equal) alternative.

12. (i) Yes, absolutely.

(ii) Yes.

13. Details are possibly set too far in advance. It is desirable that the Commission should be able to act "without political backing" within agreed financial limits and consistent with broadly defined objectives.

14. It clearly does concern itself with "strengthening the economic and social cohesion"—that surely is what the European Framework is all about.

I'd rather not comment on "small and medium sized enterprises". That is a UK obsession, largely political and rarely relevant.

On selection procedures, I wish the UK would be seen to be totally committed to the whole concept, if only to ensure that individual UK influences can then be fully brought to bear on shaping the programme detail.

Dr D H Roberts

Provost

12 March 1990

Letter from Mr Graham Blythe, European Liaison Officer, University of Bristol

The European Committee of this University has requested that I should submit written evidence to the European Communities Committee of the House of Lords regarding the EC Framework Programme.

I would like to preface my remarks with two comments:

- (a) As I write at your request at the beginning of January, I am conscious that this submission of evidence is made after the Framework Programme has been agreed by the Ministers of the 12. I can only hope that something of these remarks may have an influence on the way the British Government shapes EC scientific funding in the future.
- (b) It was surprising that certain of the questions in your letter of 7 November imply an expected or preferred answer.

Against this background, to take in order the later questions in your document of 7 November, I would wish to make the following remarks.

Question 1, 5 and 8

As regards questions 1 and 8, I believe the Commission has taken account of the rapidly changing scientific scene and needs of the Community. In consultation with Member States the new Framework Programme has been developed sufficiently to accommodate the requirements of the Community as we move into the 1990s and beyond. By pooling its resources the European Community's objective of consolidating its industrial and scientific base can be furthered. Framework provides the continuity that scientists require to progress their work; the earlier protracted political wrangles regarding the future of Framework damaged ongoing scientific research projects. As a result, in some instances scientists were thrown out of work at a time when European scientific expertise is needed to offset the challenge of Japan, the Newly Industrialised Countries (NICs) and the United States. The careful step-by-step growth of Framework is providing European science with what it needs and Commissioner Pandolfi's latest proposal for a rolling Framework Programme to allow scientific work to continue is admirable.

I cannot comment on question 5 except that the actual proposed expenditure differences is a matter of straightforward comparison. Otherwise the reduced support for energy-related projects is a cause for concern when both Europe and indeed the world are and should be becoming more energy-conscious.

Question 9

In conversation with both industrialists and academics, the general feeling is that:

- (a) the Commission has achieved the right balance between research and development.
- (b) From the University's point of view especially, in its major programmes such as ESPRIT, BRITE/EURAM, the Commission does not give sufficient emphasis to basic research, the source from which all future applied and targeted research springs. This opinion is held despite the high degree of success

being achieved by applications from the University of Bristol both for collaborative, basic and applied research.

In this regard it would be appreciated if the House of Lords could apply pressure on the European Commission to augment the support available for basic research.

- (c) To date the pre-competitive nature of the European Commission's programmes has been pitched at a high enough level to galvanise other forms of research. This suitably complements the impact of collaborative research such as that undertaken by EUREKA and COST as well as specialised activities undertaken by such institutions as the European Space Agency, the European Science Foundation, the Council of Europe and NATO.

It is right that the Commission continues along this path and allows the more targeted EUREKA programme to take industrial research directly from laboratory to market.

Questions 3, 7, 10

While it may be true that the European Commission may not have reviewed the Framework Programme as a whole, it is certainly not the case that its individual components have not been examined. The Commission seems to be particularly conscious about the reception of all its activities. Especially in the case of the larger programmes of Framework, it has gone to great lengths to ensure that its activities are independently evaluated. This both demonstrates the autonomy of the EC in reviewing its own system and in some ways shows that it does not have enough in-house staff to carry out a full investigation.

Given that all European Community funds arise directly or indirectly from European tax-payers, evaluation is essential to ensure that those tax-payers are getting value for money. The criticism that can be levelled at the evaluation process of the European Commission, is that for the task of evaluation it would appear that all too often a small number of consultants and agencies are selected and perhaps insufficient consideration is given to the wider view of academics and industrialists working in their own particular field of Commission activity. When the wider scientific community is involved in evaluation of the programmes, the Commission perhaps does not do enough to ensure, in conjunction with Member States, that the advisory expert teams upon which it draws are truly representative of the chosen disciplines, and that they reflect the best overall advice the Community requires. For example, when the BRITE team evaluated the first stage of its programme 1985–88, in the case of the United Kingdom it only drew upon the expertise of Imperial College, London, to assess its performance. Similarly in Spain only the University of Valladolid was called upon. Whilst these institutions would have offered good advice, by no stretch of the imagination can they represent all the view of the British and Spanish higher education communities.

Although it may be accepted that the overall evaluation of the programmes of Framework is in need of review, the academic community, in general, is satisfied with the system of "peer review" for their specific proposals. However, the Commission cannot be complacent and must ensure that to keep pace with the rapidly developing scientific scene its lists of referees are regularly updated to allow for their regular refreshing by the inclusion of new scientific talent. A brief synopsis of the reasons for failure of any proposal should be made available to assist scientific teams both if they are to re-submit a revised proposal and also to give them the opportunity to question a decision if it appears to be wayward.

It would be appreciated if the House of Lords could lend its weight to ensuring these above considerations are met.

Question 11

If anything the balance between directed and reactive research is swinging too heavily in favour of directed research. The exchange of expertise between academics and industrialists, which is facilitated by Community funding, should be given a freer rein to develop areas of research which they have identified as in need of pursuing.

The SCIENCE Programme of DGXII is a positive exception to what has largely been this European directed research. SCIENCE, with no pre-ordained programme of research—except that projects should display scientific excellence—has, with only a tiny fraction of Framework's budget, allowed funds to be spent on emerging scientific areas when the larger programmes have been powerless to assist. Whilst the parameters of research and financial guidelines concerning these programmes have been pre-determined, SCIENCE has been able to fund superconductivity projects before superconductivity was fashionable, develop optics in computing and provide a suitable European catalyst for adaptive intelligence and neural networks. The latter provides a good example of where seed corn monies for reactive research has progressed this area to move it into a directed programme, BRAIN. Of course Europe's needs are such that targeted, industrially-related research is required. However, as mentioned, it is for the House of Lords to ensure that the Commission draws upon a wider body of expert evaluation and adds its weight to make certain that the Commission allows more monies to be allocated to basic research, especially in the larger research programmes of the EC.

Question 12

If Europe is going to compete on the world market, it requires a strong research base to enable this to happen. Research—in particular, industrial research—may involve nothing more than refining and

developing techniques. However, the combination of more efficient processes and good products is a world beater. Europe cannot afford to adopt the attitude that Japan, the United States or another state is already undertaking research in a certain field and hope to exploit the results at a later date for its own benefit. Europe, by retracting into its own shell, will never progress but will rapidly become nothing more than the assembly arm of some other power. To prevent this, and to keep Europe competitive, the EC must give succour to new and emerging areas of technology and research. To achieve this the Commission must remain alive to the latest developments and be on line to offer support when it is required.

Question 13

In terms of the research community, the perennial criticism is that they do not have sufficient warning of new initiatives. Early information about new and emerging programmes is essential if research teams are to be properly prepared for any forthcoming action. The lead-in time to set up a European collaborative project can be considerable and needs to be well-executed if the team is to have a good prospect of success. Certainly the Community has much improved its communication regarding new activities and with the rise of so many "Euro expert agencies" the message is by and large coming through in time.

What frustrates the scientist is a new programme such as Human Genome Analysis or Aeronautics being flagged up, time and money being spent tracking its course, and encouraging a team to come together, only to be told political decisions have delayed the activity. To prevent such a situation arising, the Commission and civil servants of national Member States should provide Government with all details it needs to see whether it should support a programme at the earliest possible stage. If Member States do not like what the Commission is doing, it is for them to move early rather than late. Of course, the kernel of the problem may be that we have a vibrant ever-faster moving Commission with Member State monitoring facilities only sufficient to deal with the output of the Commission in the late 70s and early 80s. This is well known, but it is for institutions such as the House of Lords to see that their Committee structures and national civil servants are suitably equipped and staffed to meet the needs.

Question 14

Framework, of course, should be seen alongside the impetus of the much-vaunted 1992. Europe of the Single Market will see winners and losers. However, to minimise the loser category, it is correct that the Commission should, via such mechanisms as Framework, allow those less powerful Member States to raise their scientific and research base in association with what is perceived at present—the scientific strength vested in the stronger economies. By raising the scientific base of Europe as a whole, it will be in a stronger position to compete post-1992 and beyond.

The question also assumes some inherent strength in perhaps the Northern European scientific communities. By and large that may ring true at the start of the 1990s, but is certainly wide of the mark when particular scientific strengths are examined in other Member States. Spain, for instance, particularly with its rapidly developing economy, is a strong, vibrant and increasingly, a scientific force with which to be reckoned. To take only one Spanish example, the Polytechnic of Madrid with involvement in nearly 30 ESPRIT projects, shames the British higher education community where individual institutions are fortunate if they are involved in up to 5–10 projects.

Further, in the case of industry, whilst the EC of the 12 can boast of some particularly powerful companies, it would be sheer recklessness only to concentrate on building their strengths at the expense of the small and medium-sized business community. Whilst a special Directorate General has been set up to accommodate SME interests and specific programmes such as BRITE/EURAM to encourage SMEs to participate via Feasibility Studies, if anything this is not enough. The House of Lords should demand that the Commission gives more weight to SME research development to ensure their potential is allowed fully to develop. This should not so much compromise good science but should facilitate new ensured European growth.

I trust the Committee of the House of Lords will find this information of use. Should the Members be in need of any clarification I, of course, shall be most pleased to assist.

Graham Blythe
European Liaison Officer
8 January 1990

Letter from Dr E W Thompson of the University of London

I am replying to the first paragraph of your letter of 2 March, asking for our views on the question of additionality of Community funding.

Before looking at specific examples, I thought that it might be helpful to define the various terms which are used. The principle of additionality, whereby Member States contribute an additional sum of money to match sums received from the Community, has long been the policy goal of the Commission. In the UK however, it has been well established for a number of years that this additionality principle is rarely

followed. As well as general lack of adherence to this principle, a further problem in the UK is the problem of non-additionality which, in some ways, is the converse to additionality. Experts working in the field of EC funding tend to note only exceptions to the rule of non-additionality such as elements of the Belfast Integrated Development Operation Programme (IDOP), of a few years ago, and more recently the funding for Kilroot Power Station in Northern Ireland. [Dr Quigley of the Department of Economic Development, Northern Ireland would be able to give a view on this specific example].

The way we understand non-additionality works is that the EuroPESC system controls the total level of public expenditure in the UK as part of a Keynesian macroeconomic policy. Money received from Brussels is set against Departmental spending levels in a way which roughly correlates the funding they receive from Brussels with the reduction in their permitted expenditure. It is understood that the main rationale for this system is to maximise the benefits of public sector EC receipts in reducing UK public expenditure, as the UK is a net contributor to the EC budget.

Operation of this non-additionality principle leads on to the separate question of attribution. This refers to where reductions will be made in the expenditure patterns of departments to satisfy the Treasury claw back. This is a particular concern of SERC. As more of the Framework Programmes move from technology to science there is concern that money coming in from Brussels may be attributed to the science vote rather than to DTI.

It is extremely difficult to ascertain whether there is any increase in UK Departmental expenditure as a result of funding allocations from Brussels. An analysis of replies to parliamentary questions over the years indicates a consistent ministerial line that the level of expenditure on a given activity, such as Regional Selective Assistance is at a level higher than it would otherwise have been if Brussels funding had not existed. However, if one looks at expenditure on regional policy over the years it is difficult to demonstrate this statistically. As EC regional expenditure has risen, UK regional expenditure in real terms has declined. However, it is impossible to prove that it would not have declined further if funding from Brussels had not existed.

Examples of the way in which Brussels and UK Departmental expenditure intertwine are best obtained from an examination of those Civil Servants in the Treasury, DTI, DES and Cabinet Office who are concerned with the operation of the policy. At an informal and anecdotal level, however, it has been understood from Civil Servants over the years, that their lack of enthusiasm for EC programmes has been directly related to recognition of the financial penalties that would fall on their Departments if EC programmes are started or expanded. Specific examples in which the non-additionality problem has occurred are often difficult to demonstrate because evidence lies in things not happening for which other justifications can often be cited. The following examples, however, illustrate the problem.

In the field of Structural Funds, we can give two clear examples which possibly serve as a warning to the HE sector:

- (i) Paisley Central Institution. An award of £200,000 from the European Regional Development Fund (ERDF) was made to Paisley for the development of a small business centre. It is understood that the Scottish Education Department was surprised to be subsequently told by the Treasury that it had to reduce its expenditure (ie find savings) by a similar amount. In the event, we understand that the Scottish Office assisted SED by finding savings of £50,000, leaving SED to reduce its expenditure by £150,000.
- (ii) Warwick University. The University put forward proposals to build an applied R&D centre at the University with the aid of ERDF funding. The possibility of making a submission to the Regional Fund was a matter of some discussion in the DES, the Cabinet Office and the Treasury. It is understood that Warwick was seeking £1 million and had intended to use the additional money from the EC to construct a larger building for the centre. After much discussion it is understood that the Treasury ruled that the University could receive the money, but the DES would have to make a saving on its expenditure equivalent to the grant received from the ERDF. DES then declined to support the application to the EC and, as a result, the DoE would not put it forward to Brussels. Warwick constructed a smaller building than they would have done with ERDF support. It is understood that one factor the DES considered was the knowledge that consultants working in this field had eight or nine similar projects waiting on the result of the Warwick test case.
- (iii) A third example is drawn from a Structural Fund support service. This relates to an example under the ERDF Article 15 procedure (Old Regulation). The Article 15 powers provided for the possibility of funds being made available to support the establishment of an applied regional policy Research Centre, technology transfer, and business services. It is understood that a programme, involving the Economics Departments of Dundee University, Stirling Business School and the Research Unit at Strathclyde University was being prepared for a possible ERDF Article 15 submission, but not proceeded with on the advice of the Scottish Office. No funds could be made available because of the need of the Scottish Office to find matching savings. In the event, it was decided two years later to make limited funds available nationally for Article 15 proposals, but by then the educational institutions concerned had given up and pursued other activities.

- (iv) The implications of non-additionality in more general terms for HE bodies is perhaps best indicated in a letter from DES which was sent in July 1988 to all Polytechnics. The letter states "It is a well-established principle—the non-additionality rule—that EC grants to bodies wholly or substantially funded by the Exchequer should not be treated as additional income but used to reduce public expenditure". The letter goes on to make it clear that the Polytechnics, which were at the time assuming a new status and no longer a part of LEA expenditure, would, as a result of application of the non-additionality rule, see a consequent reduction in their grants following receipt of any money from the EC. The areas where this was most expected to apply would be the European Social Fund (ESF) from which HE institutions in the UK received about £16 million in 1989. It is understood that the letter caused considerable concern in Polytechnics. As a result a number declined to make applications for EC funding, and the Committee of Directors of Polytechnics (CDP) took up the matter with the DES. Our current understanding is that, for the time being, the Department is taking no action on the matter, but if you would like to pursue this further you could contact the CDP.
- (v) R&D.

Examples in this field are more difficult to find. It is widely understood, however, that the growth of the ESPRIT programme contributed to the almost total demise of ALVEY. Both programmes are concerned with the development of industry-university collaborative IT research. The difference between them, however, is that priorities for ALVEY were determined in the UK by a combination of UK companies and academic researchers, whereas ESPRIT priorities were determined through a European process to which the UK had made a more modest input and where, in fact, the academic input was extremely small. The ESPRIT programme was initially drawn up through consultation between the Commission and 12 major European companies without either the UK Research Councils or UK academic institutions being able to make a contribution.

In conclusion, the growth of more science orientated programmes in the EC and the potentially greater involvement of the DES (for example, DES has recently taken over responsibility for the Medical and Health Research Programme from the Department of Health) would be a matter of concern to the University of London if all that happened was that European expenditure replaced UK expenditure. This concern is not just quantitative but, as indicated in the ESPRIT/ALVEY example above, it is also qualitative in that UK priorities for scientific research have in the past been based on rigorous peer group review. A similar opportunity for rigorous peer group review of EC research priorities does not, at least at present, exist to the same extent.

I do hope your Committee finds these views helpful. We will be submitting detailed comments on the Framework Programme as requested¹.

Dr E W Thompson
Faculty Officer
Science and Engineering
22 March 1990

Letter from Professor Sir Mark Richmond, The Vice-Chancellor, The University of Manchester

I am now replying briefly to the "additionality" issue raised in the first paragraph of your letter of 2 March.

You will realise that I am in the somewhat constrained position of taking over from Professor Mitchell in October. Under those circumstances I really would not want to comment too specifically on the matter. I do agree, however, that the "additionality principle", at least as it seems to be exercised by the Treasury, is a matter for very considerable concern and I believe you are right in focussing on it as an important issue. At its worst, if I understand the matter correctly, the principle leads to the Research Councils being debited for a programme that they didn't agree to and for particular awards that they have played no part in assessing. That cannot be satisfactory.

13 March 1990

Memorandum by Dr C E Webb of Oxford University

Question 1—How far is a European programme for R&D desirable at all?

One of the major benefits of UK membership of the EEC must surely be the stimulation to UK manufacturing industry which can be brought about by collaboration across national boundaries in some areas of science and technology. The encouragement given by MITI to enable Japanese companies to collaborate in research projects at the pre-competitive stage has undoubtedly brought benefits to Japan.

¹See pp 87 ff above.

It would seem that a similar attempt to encourage European industries to collaborate at the pre-competitive stage could only be beneficial.

However, I would like to express one reservation. I think it is very important to maintain a correct balance between support for international collaboration in research and support for research within the country. If there are conflicting demands on funding it would be wrong to penalise good programmes of research within the UK for the sake of appearing to be good Europeans.

Which are the areas where collaboration between the Community and Member States will be most beneficial?

Most benefit is likely to be obtained by the various EEC Member States adopting uniform standards in such industries such as IT and communications. There must be benefits in harmonising standards at an early stage in the development of any new technology, and IT and communications are two industries which could clearly benefit in this way. Characteristic features of these industries are firstly that they need to be able to react quickly both to changes in technology and in the market place and secondly that they do involve the innovative capacity of small enterprises to a larger extent than many other sectors of industry.

At the other end of the range of timescales is the long-term research demanded by the energy supply industry, particularly in regard to nuclear power. Here too there must surely be some benefit to be obtained by harmonisation of efforts in nuclear power research within the EEC especially in such enterprises as JET where it is a very long-term future that is being addressed. Even if collaboration in this type of research should extend beyond the bounds of the EEC, the representation of the various EEC Member States will be stronger if the EEC members act together than on an individual nation by nation basis. The same applies to considerations of the environment, where once again if Europe can speak with a unified voice, the EEC's priorities and its favoured solutions (perhaps involving European made equipment) will be the ones likely to carry weight with the international community of nations.

Are the six areas identified for Commission support the right ones?

I believe they are.

Question 2

As I understand it, the simplification of headings envisaged for Framework III may allow greater freedom of transfer of resources within the budgets of the individual headings. This I would regard as an advantage. It should enable unpromising areas of research programmes to be terminated and their resources transferred to those that look more promising with a minimum of bureaucratic delay. To allow such freedom it is almost necessary to leave the headings rather broad. There is no danger in this provided that good review and management procedures ensure that the individual programmes are not vague and diffuse in their objectives but are tightly drawn, with specified goals and milestones against which progress can be assessed.

Question 3

Many of the research lines—if not the actual programmes already started under Frameworks I and II are likely to continue under Framework III and so the “newness” is likely to be more in name than substance.

Question 4

In none of the documents that I have seen is there a fully detailed case made out for the amounts suggested under each of the programme headings. Inevitably such an exercise involves a great deal of guesswork since the demands of a research programme five years hence are difficult to foresee in any great detail. To the extent that inflation of costs of high technology equipment tends to run well ahead of inflation indexes generally it is no surprise that the annual cost of Framework III is substantially increased over that of Framework II. However, the budget increase proposed does seem a fairly hefty one and must surely imply an increased volume of research under Framework III. I would be happy to see this happen, provided it is not at the expense of other programmes such as EUREKA which is also a very valuable area of international collaboration. So long as the quality of the research carried out under Framework III is guaranteed by the application of good review and project management techniques, I would be happy to see an increase in the budget for Framework, although the proposed level seems to be at the upper limit of what one might have expected.

Question 5

In view of the finiteness of oil and gas reserves, and the generally detrimental effect on the environment of continued reliance on fossil fuels, research into nuclear energy and alternative energy sources seems to me imperative. It would only take another short fall in the supply of oil such as we experienced in the 1970s with the Arab boycott to alter drastically the economics of energy production. In any case, it seems profligate to use up limited oil and gas reserves for heating or the generation of electricity. These materials will be needed in the longer term as feedstocks for petrochemical industries.

An adequate level of funding in nuclear programmes (fusion in particular) would seem to be essential. In this respect I think that the decision to cut energy funding is disappointing and somewhat shortsighted. The near-term view to be taken by investors in private industry will mean that with increasing privatisation,

the only source for long-term research budgets for fusion power may have to come from such sources as the Framework programme.

Recent years have seen considerable advances towards the achievement of viable thermonuclear fusion in magnetic confinement experiments. Although the road to a practical fusion reactor is likely to be a long and difficult one it seems to me that we should not give up trying now. It may be that we have to conduct this research on a truly international basis with the United States, Japan and the USSR as well as the EEC involved. However, there is every reason to have a strong contribution from the EEC, since the EEC is likely to be the main beneficiary of an environmentally acceptable form of nuclear power generation.

Question 6

Effective research programmes and research teams cannot be put together in a period of much less than one year. Therefore some degree of continuity is desirable. On the other hand research teams should not be allowed to fall into the trap of thinking in such long-term timescales that a sheltered approach with guaranteed income for life grows up. There are, unfortunately, several examples where this has happened in the past. The three to four year programme horizon seems to be about the right one allowing for thorough review on an annual or bi-annual basis.

The kind of contract research carried out in the USA on military contracts with reviews every six weeks and funding for one year only would not seem appropriate for Europe. It is very wasteful both in sheer financial terms and also in terms of scientific manpower and administrative effort. It could only be justified if the results were wanted so immediately that almost any amount of expense could be justified in order to gain them.

I would argue then, in favour of the idea that the programmes should have a rolling nature but should only be renewed if they continue to show good progress.

I would hope that a reasonable proportion of the budget allocation could be reserved so that new projects can be funded under the six general headings listed in the proposal document and that the existing projects should have to compete for this resource with new projects which come up after 1992.

Question 7

No in my opinion it does not. I find it very difficult to get a clear idea of what is involved in the evaluation of the projects from reading the proposal document and I would like to see the mechanisms for evaluation much more clearly specified.

Question 8

The main difference seems to be more in style than in content. With the smaller number of programme headings and the wider subject content within each, the Commission is apparently indicating a readiness to transfer funds within each of the broad subject areas into the most promising lines of research. Results of this policy will probably not be apparent until after the first two years of the new programme. However, I am in favour of this increased degree of flexibility and I think the Commission has justified that degree of change.

Question 9

The proposed Framework III programme in common with Frameworks I and II, is aimed at a pre-competitive level of research. It is not intended to address development "near market", and "productisation" activities. Clearly these are areas more relevant to funding under the Eureka programme where the division and assignments of the intellectual property rights are properly matters of great concern to the collaborating companies and institutions. Provided that support for Eureka remains strong then I think the emphasis of the Framework III proposal is correctly on pre-competitive, pre-normative research. Successful projects which emerge from the Framework programme can be carried over into Eureka when they reach the stage for development towards the market.

In regard to the balance between basic and applied research, this balance is largely imposed by the nature of the fields supported under Framework. For example, in IT and communications, most of the research is likely to be of a fairly applied nature, whereas in the energy and environmental programmes most of the research is likely to be of a much more basic kind. To the extent that I think the overall mix of subject headings in the Framework proposal is about right, the mix between basic and applied research is likely to be satisfactory.

Question 10

There does seem to have been some weakness in Frameworks I and II over the question of evaluation. The mid-term review of Framework II carried out by the "five wise men" resulted in a perceptive and very worthwhile document. However, it was clearly put together under considerable pressure of time and does not contain the amount of individual detail that one might have looked for in a full evaluation of the achievements (or lack of them) under Framework II. Much stronger and more rigorous reviewing procedures are definitely required.

There would seem to be a need for an international review body of eminent scientists, engineers and industrialists drawn from academic institutions, government research laboratories, and industrial research organisations within the Community. Adequate funding should be available to such a body to ensure that it has the ability to send small teams of experts to visit and examine for themselves the quality of the research and the progress achieved. Reviews should be carried out perhaps at yearly intervals by specialist sub-groups of the review body. There may well be a role here for members of the international research community at, or near, retirement age. The review body should be able to draw on peer review for advice but should be independent and able to form its own conclusions and it should have the power to increase, decrease or remove funding for individual projects within the budget set for each programme heading.

Question 11

There is certainly a need for the Community to be able to react to interesting new research ideas. However the nature of European research with its concept of subsidiarity and the timescales for approval of proposals implies that the preponderance of Community funded research will be of a directed, rather than a reactive nature. I see no danger in this, provided that individual national programmes have enough resources to fund adequately new ideas which may emerge and which need immediate tests or proof of principle experiments.

However, there will no doubt still be some new topics (eg high temperature super conductivity) which arise suddenly during the course of a Framework budget and it would be a pity if there were not funding within the Framework programme to allow a co-ordinated European effort to be mounted in these areas. Thus, a ratio of perhaps three to one between the funding for directed rather than reactive research seems to me appropriate for such a programme as Framework.

Question 12

If we were to debar the Community from undertaking research already underway somewhere elsewhere in the world there would be precious few areas in which we could perform research. This is especially true of directed research, which by its very nature concerns established fields of research interest.

In order for the results of research to be effectively carried forward into the stage of product development usually requires some continuity of "hands-on" experience within an organisation. One cannot simply rely on reading scientific papers alone to transplant new technology into industry. A degree of involvement and participation is required which goes beyond just reading the scientific journals published elsewhere. In any case, most applied research is carried out under some restrictions of intellectual property dissemination and the key features of the "black art" which make certain scientific technologies viable are often simply not disclosed in the open literature.

There is no substitute for doing one's own research. It is therefore necessary for Europe to be involved in all areas of research which underpin its high technology industries. Hopefully, as scientific and industrial collaboration within the European Community increases, there will indeed be a growing need for collaborative research in new areas.

Question 13

I really cannot comment with any authority on this topic, except to say reiterate that I would wish to maintain maximum flexibility to divert the funding of programmes within a given programme heading, subject to good review and project management procedures.

Question 14

As the head of a University research group, and the Chairman of a small high-tech manufacturing company in the laser field, I have considerable interest in this question. In particular, I have a strong reaction to the last sentence which seems to imply that admitting small enterprises to Framework participation will somehow *reduce* the quality of programmes. I should like to put on record my firm conviction that the vigour and inventiveness characteristic of the research teams of small companies, especially those in companies founded for the very purpose of exploiting new technology, will *improve* rather than impair the quality of the research project in which they are involved. The ability of a small company to survive and prosper depends in no small measure on its ability to innovate. The members of its research and development departments are under no illusions concerning the effect that their efforts may have on the future of their company and themselves.

In my opinion it is the University research groups and the R&D departments of high technology companies they "spin-off" which are the well-springs of innovation today. Evidence for quality and strength in science and engineering still to be found in British Universities is provided by editorial in The Times Higher Education Supplement of 1st December 1989 which refers to a review of the 100 best European Universities published in the December issue of the French periodical Liberation. That review ranked departments of British Universities consistently as in the top five amongst all European Universities.

Despite this it is a sad fact that in the UK Universities and small companies find participation in Framework programmes particularly difficult. It is not for want of trying, but simply for lack of the resources needed to "get on board" by devoting the time and manpower to the paperwork and consultation with Brussels

officials that seem to be necessary in order to be successful in making an application for funding under Framework. Large companies can afford to maintain departments whose function it is to cope with the bureaucracy in Brussels.

Amongst British universities the situation under Framework II was extremely patchy. Only a few University research departments (principally those in the applied fields of IT and communications) managed to get any substantial funding under Framework II.

In Framework III particular encouragement should be given to the contribution that can be made by universities and small companies both in this country and throughout Europe. This encouragement should take the form of reduced barriers to participation imposed by the formidable amount of paperwork and bureaucratic delay involved in making applications for funding.

The programmes which encourage travel, for young graduates and post-doctoral research workers, should also be adequately provided for in Framework III. It is important that such schemes should fund not only travel between European centres, but also provide travel funding for European research workers for short visits to laboratories and international conferences in the USA and Japan. It is vital for our young researchers to have rapid access to the latest results of research worldwide.







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