The Office of Science and Technology : scrutiny report 2002 : report, together with proceedings of the Committee, minutes of evidence and appendix / Science and Technology Committee.

House of Commons

Science and Technology Committee

THE OFFICE OF SCIENCE AND TECHNOLOGY: SCRUTINY REPORT 2002

Seventh Report of Session 2001–02

HC 860

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THE OFFICE OF SCIENCE AND TECHNOLOGY: SCRUTINY REPORT 2002

Seventh Report of Session 2001–02

Report, together with Proceedings of the Committee, Minutes of Evidence and Appendix

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SCIENCE AND TECHNOLOGY COMMITTEE

The Science and Technology Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Office of Science and Technology and its associated public bodies.

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A list of Reports of the Committee in the present Parliament is on the inside front cover of this volume.

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Footnotes

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SEVENTH REPORT

The Science and Technology Committee has agreed to the following Report:

THE OFFICE OF SCIENCE AND TECHNOLOGY: SCRUTINY REPORT 2002

Introduction

1. Our Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Office of Science and Technology (OST) and its associated public bodies.[1] The OST is a small department, part of the Department of Trade and Industry since 1995. It is divided into two parts:

- the Transdepartmental Science and Technology Group (99 people), which supports the Chief Scientific Adviser (who is head of OST) in his role of advising the Prime Minister, the Cabinet, the Secretary of State for Trade and Industry, and the Minister for Science on science, engineering and technology matters; and

- the Science and Engineering Base Group (49 people), which supports the Director General of the Research Councils in allocating the science budget and in securing the successful operation of the seven Research Councils, which are the OST's principal associated public bodies.

2. The wide responsibility of the OST for furthering science and technology in the UK means that our Committee has a similarly wide brief to examine science and technology issues across Government and outside; but examining the work of the OST and the Research Councils is our primary role. The importance of this scrutiny role was reinforced by the resolution of the House of 14 May 2002, which approved the Modernisation Committee's Report on Select Committees and called on the Liaison Committee to establish common objectives for select committees taking into account the illustrative model set out in that Report.[2] The Liaison Committee subsequently agreed a set of ten core tasks for departmental select committees.[3] These include: "examining the expenditure plans and out-turn of the department and its principal non-departmental public bodies"; and "examining the department's Public Service Agreements, associated targets and the statistical measures employed, and reporting if appropriate".

3. Mindful of our responsibility for scrutinising the work of OST, we made an informal visit to OST on 13 February 2002 and were briefed by officials on its work. We took evidence on 15 May 2002 from Professor David King, Chief Scientific Adviser (CSA) to the Government, and from Dr John Taylor, Director General of the Research Councils (DGRC). The transcript of the evidence is printed with this Report.[4] Following the evidence session, we asked the OST a number of questions in writing. These questions arose partly from issues raised at the evidence session, and partly from our scrutiny of the Department of Trade and Industry's Annual Report 2002[5], the Estimates[6] and the outcome of the Spending Review 2002.[7] OST's response is printed with this Report.[8]

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1 House of Commons Standing Order No. 152

2 Votes and Proceedings, 14 May 2002; First Report of the Select Committee on the Modernisation of the House of Commons, Session 2001-02, *Select Committees*, HC 224-I, para 34

3 20 June 2002.

4 Ev 1-Ev 13

5 *The Government's Expenditure Plans 2002-03-2003-04: Trade and Industry 2002*, Cm 5416, June 2002

6 Main Supply Estimates for 2002-03, HC 795, and Supplementary Budgetary Information, Cm 5510

7 *2002 Spending Review: New Public Spending Plans 2003-2006, Opportunity and security for all: Investing in an enterprising, fairer Britain*, Cm 5570, July 2002. See also Official Report, 15 July 2002, cols 21-30

8 See Ev 13-Ev 24

4. The purpose of this short Report is to put in the public domain the evidence which we have received and to highlight a number of concerns.

Departmental performance targets

5. The objectives of the OST are subsumed in the objectives for the Department of Trade and Industry (DTI) set out in the Public Service Agreements (PSAs) which are published with each Spending Review. The first Public Service Agreements, for 1999-2002, were published after the Comprehensive Spending Review 1998.[9] Four objectives and 12 underlying performance targets were set for DTI, of which two of the objectives and two of the targets relate to the work of the OST.

Table 1: DTI Public Service Agreement 1999-2002: objectives and targets relating to OST

Objective 1: Promote enterprise, innovation and increased productivity

Objective 2: Make the most of the UK's science, engineering and technology

Performance targets

v) To improve the overall international ranking of the Science and Engineering Base in terms of quality, relevance and cost-effectiveness (Objective 2).

vi) To increase by 50% the 1997-98 number of companies spun out from universities by 2001-02 (Objectives 1 and 2).

6. The Public Service Agreements 2001-04 published in July 2000, after the Spending Review 2000, set broadly similar targets for OST, though in modified form.[10]

Table 2: DTI Public Service Agreement 2001-04: objectives and targets relating to OST

Objective II: to make the most of the UK's science, engineering and technology.

[Target] 5. Improve the overall international ranking of the UK's science and engineering base, as measured by international measures of quality, cost-effectiveness and relevance.

[Target] 6. Increase the level of exploitation of technological knowledge derived from the science and engineering base, as demonstrated by a significant rise in the proportion of innovating businesses citing such sources.

7. The Public Service Agreement 2003-06, published in July 2002, combines these two targets in one.[11]

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[9] *Public Services for the Future: Modernisation, Reform, Accountability*, Cm 4181, December 1998. Available via www.archive.official-documents.co.uk

[10] *Spending Review 2000: Public Service Agreements 2001-04*, Cm 4808, July 2000, Chapter 11

[11] *Spending Review 2002: Public Service Agreements 2003-06*, Cm 5571, July 2002, Chapter 12

Table 3: DTI Public Service Agreement 2003-06: objectives and targets relating to OST

Objective II: science and innovation. [Target] 2. Improve the relative international performance of the UK's science and engineering base, the exploitation of the science base, and the overall innovation performance of the UK economy.

In common with other Departments, the DTI also has a number of productivity or departmental operations targets. For example, it is expected to achieve value for money improvements of 2.5% a year across the department, to deliver all key services on-line by 2005 and to reduce staff sickness absence by 13.8% by 2003.[12] The OST is required to keep Research Councils' Headquarters administration costs at under 4% of overall Research Councils' expenditure.[13]

8. While the PSA targets themselves have become less explicit since 1998, details of how they will be measured are set out in technical notes to the PSA. The technical notes to the PSA 2001-04 (which were published with the DTI Annual Report 2001) are quite specific.

Table 4: Public Service Agreements 2001-04 Technical Notes: targets relating to OST

5. Improve the overall international ranking of the UK's science and engineering base, as measured by international measures of quality, cost-effectiveness and relevance. *Source*: OECD (http://www.oecd.org/statistics/) Science Citation Index (http://www.isinet.com) *Measured by*: International ranking on quality, relevance and cost-effectiveness of the science and engineering base output. *Date*: Annual from 2001; target date 2004 6. Increase the level of exploitation of technological knowledge derived from the science and engineering base, as demonstrated by a significant rise in the proportion of innovating businesses citing such sources *Source*: Community Innovation Survey *Measured by*: the percentage of innovating businesses, as defined by the Community Innovation Survey, citing science and technology base sources, including DTI supported standards and measurement *Date*: survey every two years from 2001; target date 2005

The Technical Notes to the PSA 2003-2006 have not yet been published. **We recommend that in future the Department publish the technical notes with the PSA itself. Doing so might prevent the impression that the targets are insubstantial.**

9. Since 2000, the way in which each Department intends to meet its PSA targets has been set out in a Service Delivery Agreement (SDA). The DTI's SDA 2000 was published

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[12] For details see Cm 5416, figure 1.2
[13] Cm 5416, para 1.157

in its Annual Report 2001 and was available on the DTI website from November 2000.[14] The SDA 2000 adds little in respect of PSA target 5, but some interesting details in respect of target 6.

Table 5: DTI Service Delivery Agreement 2000: targets relating to OST

5 Improve the overall international ranking of the UK's science and engineering base, as measured by international measures of quality, cost effectiveness and relevance.
DTI and the Office of Science and Technology will deliver this target through increasing the ranking of quality and cost effectiveness and the ranking of relevance of the Science and Engineering Base.
The OST will implement the Science Research Infrastructure Fund to renew the science infrastructure in universities and invest in three major new cross cutting science programmes: e-science, post genomics and basic technology.
6 Increase the level of exploitation of technical knowledge derived from the science and engineering base, as demonstrated by a significant rise in the proportion of innovating businesses citing such sources.
DTI and the Office of Science and Technology will work to achieve this target by: achieving a year-on-year increase in the income the university sector earns from working with business, and from spin outs and licences; increasing the amount of university/company, university/intermediary and university/intermediary/company collaborations; increasing the number of papers jointly authored by the science base and industry.
DTI and the Office of Science and Technology will also: establish permanent umbrella mechanisms to enable the Science, Engineering and Technology (SET) base to work with business, such as the Higher Education Innovation Fund in England (HEIF) and at least 24 Faraday Partnerships in the UK by 2002/3; work with other organisations in the field (e.g. Regional Development Agencies and the CBI) through the Teaching Companies Scheme (TCS) and Faraday Partnerships to increase the proportion of SMEs employing graduate scientists/engineers; ensure that innovation facilitators employed by Business Links, Faraday Partnerships and similar organisations are properly trained and aware of the scope for exploiting SET knowledge by firms; deliver final rounds of Science Enterprise Challenge and University Challenge by April 2001; develop, in partnership with Higher Education Funding Council for England (HEFCE), management arrangements for the HEIF and deliver the first round of allocations by April 2001; work with the Research Councils towards their implementation of the Small Business Research Initiative; and help commercialise research by Public Sector Research Establishments.

It is expected that the SDA 2002 will be published on the DTI website by the end of October 2002.[15] We understand that the Department will also be producing in the Autumn a more detailed Delivery Plan, a working document demonstrating how it intends to meet its PSA targets. The Public Service Agreements 2003-2006 White Paper states that "the key features of these plans" will be set out in the published SDAs.[16] **We recommend that the DTI publish its Delivery Plan in full on its website, as well as the headline SDA.**

10. In addition to the SDA, the DTI has in recent years published on its website an annual "Strategic Framework" which sets out "key priorities" for the year ahead. The Strategic Framework 2001-02 contains the following key priorities under Objective II (science and technology).

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[14] *The Government's Expenditure Plans 2001-02 to 2003-04 and Main Estimates 2001-02: Trade and Industry 2001*, Cm 5112, March 2001, Annex D and Annex E

[15] Ev 16, para 6.

[16] Cm 5571, para 1.10

Table 6: DTI Strategic Plan 2001-02: Key priorities for 2001-02 (science and technology)

- Further strengthen national capabilities in science, engineering and technology by improving the means by which strategic research priorities are identified and the quality of the science base is assessed

- Undertake and implement the results of a review of public understanding of science engineering and technology policies and activities

- Implement recommendations of current Quinquennial Review (QQR) of the Council for the Central Laboratory of the Research Councils (CCLRC), and complete QQR of the six grant awarding Research Councils

- Deliver:
  - the Science Research Investment Fund for science research infrastructure, in partnership with the Higher Education Funding Councils and devolved administrations
  - the Higher Education Innovation Fund
  - the final rounds of University Challenge and Science Enterprise Challenge

- Launch the Science and Engineering Ambassadors scheme as part of Science Year

- Develop improved mechanisms to support and encourage knowledge transfer, particularly between higher education and business, including expansion of the network of Faraday Partnerships to at least 24 by March 2002

- Work to help business recruit and retain the high quality fully trained people it requires, supporting the review by Sir Gareth Roberts of the provision of skilled scientists and engineers

- Continue to ensure world class measurement science programmes which satisfy users' needs by implementing the recommendations of the National Measurement System Review and by completing the construction of improved laboratory facilities in Teddington

- Negotiate a well-focused sixth EU Research and Development framework programme that reflects UK priorities

- Work towards ensuring UK space-related industries are ready to meet the infrastructure requirements for global electronic business and any European global satellite navigation positioning system

- Promote the conditions that will enable the UK to become an international leader in the new markets for cleaner energy and green technologies, products and services

No Strategic Framework has been published for 2002-03 and we understand that these documents have been superseded by a new system of Business Plans which is being introduced across Government. **We recommend that the Department demonstrate its commitment to openness by publishing its Business Plan on its website.**

11. **We appreciate that it is not easy to encapsulate what a Department is expected to achieve in a few clear and measurable targets, and the PSA targets for science and technology are not a bad effort. However, they are far too general and high-level to allow judgement of OST's performance.** We asked the OST whether it had more detailed performance targets than those set out in the PSA and SDA, and, if so, for a copy. The response is disappointing: "The PSA target on science and the associated SDA targets form the basis on which the performance of the Science and Engineering Base Group within OST is measured. Those targets are cascaded down to all staff through the DTI's

annual appraisal and business planning cycle."[17] We appreciate that the overall PSA targets will be reflected in individual staff performance targets, but that is not what we are after. We find it hard to believe that the OST, or parts of OST, do not have more detailed collective targets than the headline targets given in the PSA. We understand that the new Business Plans will set out targets at various levels. Furthermore, the OST's response states that the PSA target applies to the Science and Engineering Base Group: we are unclear to what targets OST's Transdepartmental Science and Technology Group is working. **We believe that OST should be more open about its detailed performance targets and intend to pursue this with the Department.**

12. In January 2001, the Trade and Industry Committee published a Report highly critical of the information available on the Department's performance against target.[18] In response, the Department has included in its Annual Reports for 2001 and for 2002 a useful chapter outlining its progress against its PSA targets. In its Annual Report 2002, the DTI states that, in respect of the 1998 PSA targets, it is on course to achieve its target of improving the international ranking of the Science and Engineering Base, though there has not yet been any improvement on baseline in the UK's share of citations in scientific papers worldwide.[19] DTI states that it has met the target of increasing by 50% the 1997-98 number of spin-out companies. [20] In 1999-2000, 199 companies were spun out from universities, compared to 26 in 1997-98; though reliable information on their survival rates – which must be a more important indicator – is not available.[21] In respect of the Spending Review 2000 PSA targets, the DTI reports that it is on course to improve the overall international ranking of the Science and Engineering Base (as discussed above). It has not yet assessed its progress in increasing the level of exploitation of technological knowledge derived from the Science and Engineering Base, as demonstrated by a significant proportion of innovating business citing such sources: baseline figures are to be based on the Community Innovation Survey 2001, a Europe-wide initiative, and will be compared with results from the next Survey in 2005.[22] We note that the DTI, in common with other Departments, will be publishing an annual Autumn Performance Report, updating the information on progress against PSA targets.[23] The National Audit Office is to validate the data systems underlying DTI's reporting of progress towards its PSA targets. We await its findings with interest.

13. OST's memorandum states that it is "reviewing the whole issue of strategic and performance management of the activities supported by the Science Budget ... and we expect to have something to say about this later this year".[24] It appears that this review relates primarily to the performance management framework between OST and the Research Councils, rather than within OST itself. Nevertheless, we await its outcome with interest. **The proliferation of documents and acronyms – PSAs, SDAs, Technical Notes, Strategic Frameworks, Delivery Plans and Business Plans – is highly confusing to the outsider. We recommend that the Government rationalise these publications, for the sake of greater clarity and transparency.**

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[17] Ev 16, para 7
[18] Second Report of the Trade and Industry Committee, Session 2000-01, *The Department of Trade and Industry: Role, Objectives and Targets*, HC 140
[19] Cm 5416, paragraphs 1.20 - 1.24
[20] Cm 5416, paragraph 1.25
[21] Qq 65-69; Ev 18, para 12
[22] Cm 5416, paras 1.95 to 1.107
[23] Cm 5571, para 1.16
[24] Ev 16, para 8; see also Ev 17, para 9

Departmental Annual Report

14. OST does not publish an Annual Report of its own: information about its activities and expenditure plans are contained in the Annual Report of the DTI. In the 2002 Annual Report, chapter 3, "The Science and Engineering Base", relates to the work of the OST's Science and Engineering Base Group and the Research Councils, and chapter 5, "Cross-Departmental Work on Science", to the work of OST's Transdepartmental Science and Technology Group. Parts of Chapter 4, "Raising Productivity and Innovation in Business", relate to OST responsibilities (Foresight, University Challenge, Science Enterprise Challenge and the Cambridge/MIT Institute, for example) . All three chapters are grouped in a section entitled Innovation Group, although, as we understand it, OST does not form part of that Group.[25] **The present lay-out of the DTI Annual Report makes it difficult to distinguish clearly between the activities and expenditure of OST and those of other parts of DTI.**

15. The OST publishes every two years, in the year following each Spending Review, a document entitled *The Forward Look*.[26] It is a useful publication, comprising a short statement from every Government Department and other body that spends money on science, engineering and technology, and from each Research Council, on its strategy for science and technology, and tables showing departmental expenditure on RD&D and science, engineering and technology; but, apart from a short statement from the CSA and from the DGRC, it contains little on OST itself. *The Forward Look*, as its name suggests, is a forward-looking, aspirational, document, not an account of what has been achieved.

16. We asked OST whether it had considered publishing an Annual Report of its own. It responded that "OST is not a Department in its own right and does not therefore publish its own annual report".[27] We accept that, as it is not a Department in its own right, OST could not present its expenditure plans formally to Parliament, but there would be value, we suggest, in it publishing an annual report on its activities. **We recommend that OST consider publishing an annual activity report of its own. If it does not, we recommend that there should be a self-contained OST section within the DTI Annual Report.**

17. Following the Government's review of departmental reports in 2001, the Annual Report 2002 contains a significantly reduced set of financial tables. The more technical tables are now published in a new and separate document entitled Supplementary Budgetary Information, which is published alongside the Main Supply Estimates.[28] **We regret the loss of financial detail in the Departmental Report, and the further proliferation of documents, though we accept that the readership for the more technical financial tables will be small. Departmental Annual Reports are a valuable source of factual information and a crucial element in Departments' accountability to Parliament: they must not become merely a glossy presentation of the Department's activities and aspirations.**

The Spending Review 2002

18. The outcome of the Spending Review 2002 in July 2002 was very positive for science. The Spending Review White Paper promises an increase of £1¼ billion a year in overall government spending on science by 2005-6 compared to 2002-03. This increase is to comprise £890 million on the Science Budget, "the major part of" £244 million for

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[25] For DTI Organisation Structure, see Minutes of Evidence, 19 December 2001, HC 459-i, Ev 4
[26] See *The Forward Look 2001*, December 2001, Cm 5338
[27] Ev 20, para 19
[28] Central Government Supply Estimates 2002-03 Supplementary Budgetary Information, Cm 5510, May 2002

DfES recurrent spending on research (of which around 80% is expected to be on science),"at least" £100 million through DfES to implement the recommendations of the Roberts Review and £50 million through DfES for science research infrastructure.[29] We note that these figures use 2002-03 (the current year) as their baseline, instead of 2003-04. Thus, the reported increase includes the increase from 2002-03 to 2003-04 already agreed in the Spending Review 2000.

Science Budget

19. The additional £890 million in the Science Budget, as reported in the Spending Review White Paper, represents an increase of an average of 10% a year in real terms. The Spending Review White Paper presents the new Science Budget as follows.[30]

Table 7: Spending Review 2002: Science Budget

	£ million			
Science Budget	2002-03	2003-04	2004-05	2005-06
Resource Budget	1,988	2,246	2,458	2,791
Capital Budget	104	131	207	205
Total Departmental Expenditure Limit	2,006	2,285	2,570	2,899

The Spending Review White Paper states that the Science Budget will receive, by 2005-06, an additional £400 million for research project funding through the Research Councils for investment in new areas of scientific development (such as proteomics and brain science); £120 million in increased Research Council contribution to the indirect costs of university research; £30 million on knowledge transfer, including a new fund for knowledge transfer from public sector research establishments; £100 million a year for postdoctoral academic fellowships and PhDs (raising the minimum PhD stipend to £13,000); and around £100 million a year for large scientific facilities such as the Diamond Synchrotron. It states that there will be a dedicated capital funding stream for university research worth £500 million, of which £300 will be from the Science Budget.[31] On the basis that this will replace the SRIF (which is to end in 2003-04), this means increased expenditure of £50 million from the Science Budget and £50 million from DfES. Adding these figures together we reach an additional £800 million for the Science Budget by 2005-06. We are unclear how the figure of £890 million is arrived at.

20. The Government's *Investing in Innovation* document, published shortly after the White Paper, gives further details. Resources for the Research Councils' research programmes are to increase by £136 million in 2004-05 and £300 million in 2005-06.[32] A further £122 million from 2002-03 to 2005-06 is to be provided for the Diamond Synchrotron. (Annual figures are not given.) An additional £30 million a year by 2005-06 is to be provided for new investments in other large facilities and the renewal of infrastructure in Research Council institutes.[33]

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[29] *2002 Spending Review – Opportunity and security for all: Investing in an enterprising, fairer Britain*, Cm 5570, chapter 25; also paras 2.18-21 and 15.4ff.
[30] Cm 5570, Table 25.1
[31] Cm 5570, para 15.5
[32] *Investing in Innovation: A strategy for science, engineering and technology*, July 2002, para 3.49
[33] *Ibid*, para 3.50

21. OST's memorandum presents the new money for the Science Budget as follows.[34]

Table 8: Spending Review 2002: Science Budget Settlement

						New money £ million
	Resource			Capital		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
New science	0	116	255	0	20	45
Large facilities				31	87	60
Knowledge Transfer	0	16	30			
Roberts implementation	10	40	100			
University research sustainability – RC indirect cost contribution	0	0	120			
University research sustainability – dedicated capital line				0	50	50

OST's figures show an increase in the Science Budget of £660 million from 2003-04 to 2005-06. The difference between this and the figure of £890 million given in the Spending Review White Paper is accounted for by the difference in baseline, plus some difference in accounting for depreciation. The OST's figures take 2003-04 as the baseline, as is the standard methodology. The Spending Review White Paper, on the other hand, uses a 2002-03 base. Thus, it includes the increase from 2002-03 to 2003-04 already agreed under the Spending Review 2000, which amounts to some £244 million. **The increase in the Science Budget brought about by the Spending Review 2002 is more accurately represented as £660 million, not as £890 million. The way in which the Spending Review White Paper presents the increases to science spending is misleading and leaves the Government open to accusations of double-counting.**

22. OST's memorandum states that the funds for new science and large facilities and some of the funds for Roberts implementation will be allocated to Research Councils during the autumn. Knowledge transfer funds will be distributed in a separate exercise "over the next year", in which universities will bid for funds from the new HEIF. The new dedicated capital line for university research infrastructure will be allocated by formula from 2004-05.

23. **The additional funds for Research Council programmes are very welcome, though the emphasis on funding of new science gives us some concern: valuable existing programmes must be maintained too.** *Investing in Innovation* acknowledges that "a key issue for the Research Councils in the period ahead will be to consolidate their existing core programmes", but also identifies a number of new areas in which investment will be considered: brain science, regenerative medicine, proteomics, sustainable energy and rural economy and land use.[35] It will be important to ensure that focus on directed programmes does not lead the Research Councils to neglect speculative research and response mode funding.

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[34] Ev 13, para 1
[35] *Investing in Innovation*, paras 3.51-3.52

24. Much will depend on the decisions on the Science Budget allocations which are still under negotiation. **We intend to take evidence from the Science Minister in November 2002, when the Science Budget allocations have been published.**

Higher Education

25. **We welcome the additional funds for research infrastructure announced in the Spending Review and the fact that it will be provided through an ongoing capital funding stream, which should facilitate long-term planning.** In evidence to us the DGRC recognised that there was "a serious level of underfunding" in research infrastructure, though he believed that the £1.75 billion invested through JIF and SRIF (the Government's Joint Infrastructure Fund and Science Research Investment Fund) had had a considerable impact.[36] However, a consultants' report commissioned by OST recently found that only 15% of research infrastructure would benefit from JIF and SRIF, and estimated that £3.2 billion was required to bring research infrastructure and laboratory equipment up to standard.[37] The additional funds will only partly meet this shortfall. We note that "an element of the new capital stream will be retained centrally to support strategic rationalisation and restructuring of the university science base".[38]

26. **We also welcome the increase in resource funding for higher education research, which will go some way towards remedying the longstanding imbalance in the dual funding system.** On the OST side, the Research Councils' contribution to universities' indirect costs will be increased by £120 million a year by 2005-06. On the DfES side, HEFCE recurrent spending on research will increase "starting in 2003-04 and rising to an additional £244 million in 2005-06".[39] We remain uncertain whether the Government will meet the recommendation, made in our recent report on the Research Assessment Exercise, that it fund in full the results of the RAE 2001.[40] **Much depends on the outcome of the DfES's current review of higher education strategy which the sector awaits with trepidation.**

Departmental science budgets

27. **While the Science Budget, and to some extent the Higher Education budget, has done well out of the Spending Review, its impact on the science and research budgets of other departments remains to be seen.** The CSA acknowledged that departments' research funding had dropped for a period after 1986, though he maintained it was currently "fairly static". He told us that he was focusing on improving the quality of department research: "once quality and fitness for purpose are excellent, I believe funding will flow much more naturally into those areas".[41] The Spending Review White Paper states that the Government is introducing "new procedures for the external review of the quality of Government science".[42] Further detail is given in the Cross-Cutting Review.[43] Though understandably guarded about naming names, the CSA admitted that he was worried about the quality of research in some Departments.[44] The Department for Environment, Food and Rural Affairs (DEFRA) is widely regarded to be a problem area. The Environment, Food

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[36] Q29
[37] JM Consulting, 2002: available via www.ost.gov.uk . See also *Investment in Innovation*, para 3.37
[38] *Investment in Innovation*, para 3.40
[39] *Ibid*, para 3.41. The devolved administrations "will receive their share of the funding ... and will, if they so decide, be able to use if to fund recurrent research in the universities".
[40] Second Report, Session 2001-02, HC 507, paras 78-79, 90
[41] Q49; also Q56
[42] Cm 5570, para 25.10; see also Q56
[43] *Cross-Cutting Review of Science and Research: Final Report, March 2002*, paras 281-285
[44] Q51

and Rural Affairs Committee has recently highlighted the erosion of Ministry of Agriculture, Fisheries and Food research spending over the past twenty years and recommended that DEFRA's review of the organisation of its science be extended to its funding.[45] It is to be hoped that the appointment of Professor Howard Dalton as its Chief Scientific Adviser will strengthen scientific research in DEFRA, but more money may also be required.[46] **We welcome the steps being taken by Government to improve the quality and fitness for purpose of scientific research by departments. It must also ensure that this research is adequately funded.**

Cross-Cutting Review

28. The Spending Review 2002 was informed by seven cross-cutting reviews set up by the Treasury. Lord Sainsbury, the Science Minister, led a Cross-Cutting Review of Science and Research, whose terms of reference were to consider how to maximise the benefits provided by public spending on science and research to the UK's economy and quality of life. It began work in July 2001 and reported its findings to the Treasury at Easter 2002.[47] We were disappointed that only a digest of the Cross-Cutting Review was published with the Spending Review, and pressed the OST to publish the Review in full.[48] **We are pleased that the Government has now published the Cross-Cutting Review of Science and Research in full. It is a very useful document and we find it hard to understand why it was not published at the time of the Spending Review. We recommend that the Government publish such important policy documents in future, without waiting for prompting by our Select Committee.**

Roberts Review and Transparency Review

29. The Spending Review was also informed by two other science-related reviews: the Roberts Review into the supply of scientific skills and the Transparency Review on the costing of university activities. The Roberts Review was published in full in April 2002.[49] The Government's response is published as an Annex to the *Investing in Innovation* document.[50] We also pressed OST to publish the Transparency Review. OST's response states that "the review has never produced a final report as such" and that the work of the Transparency Review was subsumed within the Cross-Cutting Review and reflected in the outcome of that review.[51] OST states that the Transparency Review's steering group had accepted that the universities should adopt a costing tool called TRAC (Transparent Approach to Costing) and that this system is now in operation with figures aggregated and published by the Funding Councils. One of the conclusions of the Cross-Cutting Review was that more needed to be done to embed proper costing and pricing methodologies across the HE sector and work is underway to achieve this. Now that the Cross-Cutting Review has been published, we are able to confirm that it contains very useful information on the funding of university science research, including data obtained from the Transparency Review.[52] **It is ironic that it has taken so long to bring transparency to the Transparency Review.**

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[45] Sixth Report of the Environment, Food and Rural Affairs Committee, *Departmental Annual Report 2002*, Session 2001-02, HC 969, paras 25-26
[46] See Q8-Q9
[47] Ev 13, para 1; see Q1 ff
[48] Ev 14, para 2. See www.treasury.gov.uk/mediastore/otherfiles/science_crosscutter.pdf
[49] *SET for success: The Supply of People with Science, Technology, Engineering and Mathematics skills: The Report of Sir Gareth Roberts' Review*, April 2002
[50] *Investing in Innovation*, p 95
[51] Ev 15, para 3
[52] *Cross-Cutting Review*, para 60 ff

30. Shortly after the Spending Review announcement, the Government published a another document, entitled "Investing in Innovation – A Strategy for Science, Engineering and Technology".[53] The status of this document is unclear: it is not a Command Paper and was not laid before Parliament. Indeed, copies were not made available in Parliament at the time of publication. This document purports to "set out a long-term vision for science in the UK". It provides some useful information and is for the most part sensible enough in what it says. What is curious is that it seems to have been produced by the Treasury, not OST. **We welcome the close interest being taken by the Treasury in science and engineering, particularly since this has led to additional funding, but responsibility for policy-making in this area must lie clearly with the OST.**

European Union funding

31. In addition to providing funds through the UK Science Budget, the Government also funds scientific research in the UK through the European Union. The European Fifth Framework Programme for research, technological development and demonstration activities is now nearing completion.[54] Since 1998, it has dispensed a budget of some €14.960 billion. The DGRC was confident that the UK had received a good deal from this investment: "If you measure it crudely in terms of how much money came back from the programme as opposed to how much went into the programme, the balance is positive."[55] **We recommend that the OST carry out a detailed analysis of the costs and benefits of the Framework 5 programme to UK science, and that this analysis be published.**

32. Negotiations are nearing completion on the next funding period, Framework Programme 6, which will run from 2002-2006. The total budget is €17.5 billion. Of this, €11.285 billion is to fund research focused on seven priority areas: biotechnology for tackling major diseases; next generation information technologies; nanotechnology; aeronautics and space; food quality; sustainable development; and economic and social sciences.[56] €2.925 billion is to be spent under Framework Programme 6 to structure, and to strengthen the foundations of, the European Research Area, which is envisaged as the research and innovation equivalent to the common market for goods and services. OST's memorandum states that the aim is to network national research activities, share best practice on engaging science with society, and support the planning of research infrastructure. €1.23 billion is to be spent, under the Euratom Treaty, on nuclear research and training.[57]

33. OST's memorandum states that the main Framework 6 Programme was adopted on 3 June 2002, and that it is hoped that the Specific Programmes will be adopted by the end of September, subject only to agreement on the provisions applying to the funding of research on human embryos and human embryonic stem cells.[58] It states that the UK has secured a commitment to more efficient management of the programme by the Commission.[59] OST has also assured us that it is actively encouraging the UK scientific community to access Framework 6 funding.[60] **The European Framework 6 programme is responsible for the outlay of considerable sums of public money: the UK Government must monitor it closely to ensure that the commitment to more efficient management is achieved in practice.**

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[53] *Investing in Innovation: A strategy for science, engineering and technology*, July 2002. Available via www.hm-treasury.gov.uk

[54] For details, see www.europa.eu.int/comm/research/fp5

[55] Q12

[56] Q19-Q20; Ev 15, para 4 and Ev 23, Annex C

[57] Ev 15, para 4 (iv) and (v) and Ev 24, Annex C

[58] Ev 15, para 4 (i) and (iii).

[59] Ev 15, para 4 (i)

[60] Q13; for details see Ev 16, para 4 (vi) to (x)

Restructuring of DTI

34. In June 2001 the Secretary of State for Trade and Industry launched reviews of the DTI's support for business and of its priorities and structure. In December 2001 the DTI provided us with a memorandum explaining the implication of these reviews for OST.[61] We were told that the position of OST was essentially unchanged, but that there would be a new group, the Science, Technology and Innovation Group, outside OST, one of whose objectives would be to maximise the Government's significant investment in science by providing a sharper focus within DTI on technology transfer. There was to be a new Knowledge Transfer Strategy Committee, bringing together the CSA, DGRC, the Head of the new Group and others, to ensure that the DTI made the most of its investment in the science base. The Science, Technology and Innovation Group was to be headed by the DGRC until a new externally recruited Director General was appointed. In evidence to us in December 2001, the Science Minister told us that the new Director General would be "amongst other things, the Chief Scientist for the Department".[62]

35. By the time the CSA and DGRC gave evidence to us in May 2002, the Science, Technology and Innovation Group had been renamed simply the Innovation Group. We were told that the Secretary of State had decided that one word was enough for each of the new groups.[63] While we agree that complex titles are best avoided, we fear that the name change may risk a loss of focus on science and technology. The post of Director General Innovation was filled on a temporary basis by a DTI official, Alistair Keddie. An external candidate, David Hughes, formerly of BAe Systems, was finally appointed in September 2002 and took up post on 3 October.[64] **We intend to take evidence from the new Director of Innovation at DTI at an early opportunity. It will be essential for the new Innovation Group to work very closely with the OST, if it is to achieve what was intended.**

Quinquennial Reviews of the Research Councils

36. The outcome of a Quinquennial Review of the six grant-awarding Research Councils was announced in December 2001. It found that the Research Councils system was broadly working well, but that a clearer strategic framework was required, that they needed to work more closely with their stakeholders in a more collegiate fashion, and that they should be more focused on public service delivery.[65] It made some 50 specific recommendations. An implementation plan was published in August 2002.

37. Among the Quinquennial Review's recommendations was that a Research Councils UK Strategy Group be formed, comprising the Chief Executives of the seven Research Councils and the DGRC, in order "to enhance the collective leadership and influence of the Research Councils and to secure greater strategic co-ordination in the funding of science". Research Councils UK – or RCUK, as we fear it is to be known – was launched on 1 May 2002, and is staffed by a small secretariat based, with most of the Research Councils, in Swindon. The DGRC identified three areas in which he expected Research Councils UK to add value: a more coherent approach to research funding; a focus for dialogue; and greater operational efficiency.[66]

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[61] HC459-i, Ev 1-Ev 5.
[62] HC459-i, Q3.
[63] Q58.
[64] DTI Press Notice P/2002/586, 23 September 2002.
[65] Quinquennial Review of the Grant Awarding Research Councils Stage 2 Report by the Review Team, November 2001. Available via www.ost.gov.uk
[66] Q71

38. The Council for the Central Laboratory of the Research Councils (CCLRC) has also been subject to a Quinquennial Review. The review, published on 30 April 2002, recommended that CCLRC should act as the national focus for large scale facilities for neutron scattering, synchrotron radiation and high power lasers, and that it should receive direct funding from OST for providing, operating, maintaining, developing and upgrading its large facilities and their instrumentation, rather than through annual service level agreements with the individual Research Councils. It set out a number of areas in which improved performance was required.[67] OST's memorandum states that the new arrangements will contribute to a more strategic approach to the investment, management and operation of large facilities, and that the direct funding arrangement will ensure that the Chief Executive of CCLRC is clearly accountable for the delivery of these facilities.[68]

Arts and Humanities Research Board

39. While the Research Councils are responsible for funding basic research in the sciences and social sciences, research in the arts and humanities is funded by the Arts and Humanities Research Board (AHRB), which is accountable to the DfES. The AHRB was established as an interim measure in 1998 following the recommendation of the Dearing Committee that there be an Arts and Humanities Research Council. In July 2002, the report of the DfES-led Review of Arts and Humanities Funding was published, recommending that the AHRB become a Research Council, operating UK wide, under the aegis of OST.[69] It also suggested that the British Academy (which partly funds the AHRB) might also be funded by OST – rather than by DfES as at present – in the same way as the Royal Society and Royal Academy of Engineering. The Government is consulting the Devolved Administrations on the future of the AHRB and is expected to announce its response to the Review later in the year. The indications are that the change will happen but it is unclear when. The creation of an Arts and Humanities Research Council will require primary legislation, and thus the change, as OST's memorandum states "would be bound to take some time to enact given the pressures on legislative time".[70]

40. The DGRC told us that he was very positive about the change: "There are many areas of overlap with the sciences, engineering and technology ... It can only be advantageous to have a single funding organisation, in other words to move AHRB from its position in DfES into the OST."[71] The Chief Executive of AHRB is already attending meetings of Research Councils UK as an observer.[72] The DGRC told us that the change might require OST's name to be changed: the CSA suggested OST might become "the Office of Research".[73] **We welcome the proposal for an Arts and Humanities Research Council under the OST and will be following developments closely, as this change has considerable implications for the future of OST and its place within Government.**

Associated Public Bodies

41. Our order of reference requires us to scrutinise the "associated public bodies" of the OST. Identifying these bodies is not entirely straightforward: there is no formal list showing which of the DTI's non-departmental public bodies (NDPBs) fall within the responsibility of OST. The Research Councils certainly fall into this category, as does the

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[67] Quinquennial review of the CCLRC Stage 2 "Improving Performance", April 2002. Available via www.cclrc.ac.uk
[68] Ev 18, para 15
[69] Available via www.ahrb.ac.uk
[70] Ev 18, para 14.
[71] Q83
[72] Q82
[73] Q84

Council for Science and Technology and also, in part, the Agriculture and Environment Biotechnology Commission and the Human Genetics Commission.

Council for Science and Technology

42. The Council for Science and Technology (CST) is an advisory NDPB, first established in 1993, whose purpose is to advise the Prime Minister on the strategic policies and framework for science and technology in the UK. It is, in effect, a committee of "the great and the good" in science and technology, meeting quarterly, with a small secretariat provided by OST. Its chairman is nominally the Secretary of State for Trade and Industry, though its meetings are normally chaired by the Science Minister or the Chief Scientific Adviser.[74] Our predecessor Committee considered the work of the CST in two reports in 2001 and recommended that more effort should be made to disseminate its work more widely and to give more prominence to its activities.[75] The CST has published only one report since June 2001 (on the links between the arts and humanities, science and technology[76]) but has also provided input to the Quinquennial Review of the grant-awarding Research Councils, the Roberts Review and the review of Foresight. It is currently undertaking a study of the links between knowledge intensive business services and the science base.[77] **We share the view of our predecessor Committee that the work of the Council for Science and Technology should be better publicised.**

43. A Quinquennial Review of the CST was announced in August 2002.[78] The first stage of the review will examine the role and organisation of CST, concentrating on whether its function of providing independent strategic advice to Government on science and technology continues to be necessary, and if so whether CST as a Non-Departmental Public Body (NDPB) is the best way for the Government to obtain such advice. It is due for completion in October 2002. If it is decided that CST should continue, stage 2 will consider whether the way in which in which CST carries out its functions can be improved. The final report is due in December 2002.

Agriculture and Environment Biotechnology Commission

44. The Agriculture and Environment Biotechnology Commission (AEBC) was established in June 2000 to advise the Government on developments in biotechnology and their implications for agriculture and the environment. It works closely with two other advisory commissions: the Human Genetics Commission and the Food Standards Agency. It is an advisory NDPB, originally established by the Cabinet Office and MAFF: responsibility passed to OST and DEFRA in June 2001. Its secretariat is provided by OST (with administration costs shared between OST, DEFRA and the devolved administrations).[79] It has to date published two major reports (*Crops on Trial* in September 2001 and *Animals and Biotechnology* in September 2002) and an annual report on its activities in 2000-01 (in October 2001). We note that the Environment, Food and Rural Affairs Committee draws extensively on the AEBC's *Crops on Trial* report in its recent report on Genetically Modified Organisms, and commends the AEBC for its transparency.[80]

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[74] For minutes of CST's meetings, reports etc see www.cst.gov.uk

[75] Fourth Report, Session 2000-1, *The Scientific Advisory System*, HC 257, para 14; Sixth Report, Session 2000-01, *Are We Realising Our Potential?*, HC200-I, paras 35-38.

[76] *Imagination and Understanding*, July 2001

[77] See Cm 5416, paras 5.16-5.17, and CST Annual Report for 2001-02

[78] OST circular 19 August 2002. For details see www.ost.gov.uk

[79] Cm 5416, para 5.22

[80] Fifth Report of the Environment, Food and Rural Affairs Committee, Session 2001-02, *Genetically Modified Organisms*, HC 767, para 17

Human Genetics Commission

45. The Human Genetics Commission, which advises Government on developments in human genetics and their impact on people and healthcare, is an advisory NDPB reporting jointly to the Department of Health (DoH) and OST. OST has co-responsibility for the HGC's secretariat, although it is based at DoH: surprisingly, no mention is made of this in the DTI's Annual Report. We examined the role of the Human Genetics Commission in our recent Report on *Developments in Human Genetics and Embryology*.[81]

Royal Society and Royal Academy of Engineering

46. The Royal Society and the Royal Academy of Engineering are not public bodies but they do receive recurrent public funding from the OST's Science Budget. This amounts to £28.783 million and £4.770 million respectively in 2002-3. A breakdown of this expenditure is provided in OST's memorandum.[82] The purpose and value of this expenditure is examined in detail in our recent Report, *Government Funding of the Scientific Learned Societies*.[83]

Cambridge/MIT Institute

47. Another somewhat surprising line in the OST's Science Budget and Estimates relates to the Cambridge/MIT Institute (CMI). In November 1999, it was announced that the Government would contribute £65 million over a five year period from July 2000 to a collaboration between the University of Cambridge and the Massachusetts Institute of Technology (MIT).[84] This money has been channelled through OST. Under the 2002 Science Budget allocations, £14 million a year has been allocated in 2001-02 to 2003-04 to fund CMI programmes in four areas: integrated research; undergraduate exchange; professional practice; and national competitiveness network. It was intended that CMI would work with the Science Enterprise Centres to disseminate best practice.[85] The *Investing in Innovation* strategy document states that "CMI is now starting to deliver tangible benefits to UK research and business", but gives no details.[86]

48. We asked OST how the expenditure on CMI was being evaluated. OST's response states that CMI is evaluating its own activities, with the assistance of external consultants and the DTI Performance and Evaluation Unit; and OST will be commissioning an independent evaluation.[87] **We welcome OST's decision to commission an independent evaluation of the Cambridge/MIT Institute and recommend that it be published when complete. The decision to fund the CMI, made outside the usual Science Budget allocation process, is somewhat curious, and we intend to ensure that its effectiveness is monitored.**

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[81] Fourth Report of the Science and Technology Committee, Session 2001-02, HC 791
[82] Ev 21-Ev 23, Annexes A and B
[83] Fifth Report of the Science and Technology Committee, Session 2001-02, HC 774-I.
[84] Treasury Press Notice 186/99, 8 November 1999. See also www.cmi.cam.ac.uk
[85] Science Budget 2001-02 to 2003-04, page 9 and Table 2. £1,145 was spent in 2000-01.
[86] *Investing in Innovation*, para 5.31
[87] Ev 19, para 17

OST response to scrutiny

49. We are grateful to the OST, and to the DTI more widely, for its assistance and co-operation in our work of scrutiny. We acknowledge that parliamentary scrutiny places a burden of work on Departments, and especially on an Office so small, and tightly-staffed, as OST. **We hope that the Department will recognise the value of effective scrutiny, and ensure that OST is resourced appropriately to meet the reasonable demands and expectations of Parliament.**

LIST OF RECOMMENDATIONS AND CONCLUSIONS

Departmental performance targets

1. **We recommend that in future the Department publish the technical notes with the Public Service Agreement itself. Doing so might prevent the impression that the targets are insubstantial (paragraph 8).**

2. **We recommend that the DTI publish its Delivery Plan in full on its website, as well as the headline Service Delivery Agreement (paragraph 9).**

3. **We recommend that the Department demonstrate its commitment to openness by publishing its Business Plan on its website (paragraph 10).**

4. **We appreciate that it is not easy to encapsulate what a Department is expected to achieve in a few clear and measurable targets, and the PSA targets for science and technology are not a bad effort. However, they are far too general and high-level to allow judgement of OST's performance. ... We believe that OST should be more open about its detailed performance targets and intend to pursue this with the Department (paragraph 11).**

5. **The proliferation of documents and acronyms – PSAs, SDAs, Technical Notes, Strategic Frameworks, Delivery Plans and Business Plans – is highly confusing to the outsider. We recommend that the Government rationalise these publications, for the sake of greater clarity and transparency (paragraph 13).**

Departmental Annual Report

6. **The present lay-out of the DTI Annual Report makes it difficult to distinguish clearly between the activities and expenditure of OST and those of other parts of DTI (paragraph 14).**

7. **We recommend that OST consider publishing an annual activity report of its own. If it does not, we recommend that there should be a self-contained OST section within the DTI Annual Report (paragraph 16).**

8. **We regret the loss of financial detail in the Departmental Report, and the further proliferation of documents, though we accept that the readership for the more technical financial tables will be small. Departmental Annual Reports are a valuable source of factual information and a crucial element in Departments' accountability to Parliament: they must not become merely a glossy presentation of the Department's activities and aspirations (paragraph 17).**

Spending Review 2002

9. **OST's figures show an increase in the Science Budget of £660 million from 2003-04 to 2005-06. ... The increase in the Science Budget brought about by the Spending Review 2002 is more accurately represented as £660 million, not as £890 million. The way in which the Spending Review White Paper presents the increases to science spending is misleading and leaves the Government open to accusations of double-counting (paragraph 21).**

10. **The additional funds for Research Council programmes are very welcome, though the emphasis on funding of new science gives us some concern: valuable existing programmes must be maintained too (paragraph 23).**

11. **We intend to take evidence from the Science Minister in November 2002, when the Science Budget allocations have been published (paragraph 24).**

Higher Education funding

12. **We welcome the additional funds for research infrastructure announced in the Spending Review and the fact that it will be provided through an ongoing capital funding stream, which should facilitate long-term planning (paragraph 25).**

13. **We also welcome the increase in resource funding for higher education research, which will go some way towards remedying the longstanding imbalance in the dual funding system ... Much depends on the outcome of the DfES's current review of higher education strategy which the sector awaits with trepidation (paragraph 26).**

Departmental science budgets

14. **While the Science Budget, and to some extent the Higher Education budget, has done well out of the Spending Review, its impact on the science and research budgets of other departments remains to be seen. ... We welcome the steps being taken by Government to improve the quality and fitness for purpose in scientific research by departments. It must also ensure that this research is adequately funded (paragraph 27).**

Cross-Cutting Review

15. **We are pleased that the Government has now published the Cross-Cutting Review of Science and Research in full. It is a very useful document and we find it hard to understand why it was not published at the time of the Spending Review. We recommend that the Government publish such important policy documents in future, without waiting for prompting by our Select Committee (paragraph 28).**

Transparency Review

16. **It is ironic that it has taken so long to bring transparency to the Transparency Review (paragraph 29).**

Responsibility for science policy

17. **We welcome the close interest being taken by the Treasury in science and engineering, particularly since this has led to additional funding, but responsibility for policy-making in this area must lie clearly with the OST (paragraph 30).**

European Union funding

18. **We recommend that the OST carry out a detailed analysis of the costs and benefits of the Framework 5 programme to UK science, and that this analysis be published (paragraph 31).**

19. **The European Framework 6 programme is responsible for the outlay of considerable sums of public money: the UK Government must monitor it closely to ensure that the commitment to more efficient management is achieved in practice (paragraph 33).**

DTI restructuring

20. **We intend to take evidence from the new Director of Innovation at DTI at an early opportunity. It will be essential for the new Innovation Group to work very closely with the OST, if it is to achieve what was intended (paragraph 35).**

Arts and Humanities Research Board

21. **We welcome the proposal for an Arts and Humanities Research Council under the OST and will be following developments closely, as this change has considerable implications for the future of OST and its place within Government (paragraph 40).**

Council for Science and Technology

22. **We share the view of our predecessor Committee that the work of the Council for Science and Technology should be better publicised (paragraph 42).**

Cambridge/MIT Institute

23. **We welcome OST's decision to commission an independent evaluation of the Cambridge/MIT Institute and recommend that it be published when complete. ... The decision to fund the CMI, made outside the usual Science Budget allocation process, is somewhat curious, and we intend to ensure that its effectiveness is monitored (paragraph 48).**

OST resources

24. **We hope that the Department will recognise the value of effective scrutiny, and ensure that OST is resourced appropriately to meet the reasonable demands and expectations of Parliament (paragraph 49).**

LIST OF ABBREVIATIONS USED IN THE REPORT AND EVIDENCE

AEBC	Agriculture and Environment Biotechnology Commission
AHRB	Arts and Humanities Research Board
BAe	British Aerospace
BBSRC	Biotechnology and Biological Sciences Research Council
C&AG	Comptroller and Auditor General
CCLRC	Council for the Central Laboratory of the Research Councils
CE	Chief Executive
CMI	Cambridge MIT Institute
CSA	Chief Scientific Adviser [to the Government]
CST	Council for Science and Technology
DEFRA	Department for Environment, Food and Rural Affairs
DfES	Department for Education and Skills
DG	Director General
DGRC	Director General of the Research Councils
DoH	Department of Health
DTI	Department of Trade and Industry
EPSRC	Engineering and Physical Sciences Research Council
ERA	European Research Area
FP(6)	(Sixth) Framework Programme
FRS	Fellow of the Royal Society
GDP	Gross Domestic Product
GMO	Genetically Modified Organism
HE	Higher Education
HEFCE	Higher Education Funding Council for England
HEIF	Higher Education Innovation Fund
HMT	Her Majesty's Treasury
IDIL	Infectious Diseases in Livestock
JIF	Joint Infrastructure Fund
KTSG	Knowledge Transfer Steering Group
MAFF	[the former] Ministry of Agriculture, Fisheries and Food
MIT	Massachusetts Institute of Technology
MRes	Masters Degree in Research
NDPB	Non-Departmental Public Body
OECD	Organisation for Economic Co-operation and Development
OPI	Output Performance Indicator
OST	Office of Science and Technology
PSA	Public Service Agreement
PSX	Ministerial Committee on Public Services and Public Expenditure
QQR	Quinquennial Review
RAE	Research Assessment Exercise
R&D	Research and Development
RCPS	Research Councils Pension Scheme
RCUK	Research Councils UK
RfR	Request for Resources
SDA	Service Delivery Agreement
SEB	Science and Engineering Base
SET	Science, Engineering and Technology
SME	Small and Medium-sized Enterprise
SP	Specific Programme
SR	Spending Review
SRIF	Science Research Investment Fund

TCS	Teaching Companies Scheme
TDST	Transdepartmental Science and Technology [Group]
TRAC	Transparent Approach to Costing
UMIST	University of Manchester Institute of Science and Technology
UUK	Universities UK

PROCEEDINGS OF THE COMMITTEE RELATING TO THE REPORT

MONDAY 21 OCTOBER 2002

Members present:

Dr Ian Gibson, in the Chair

Mr David Heath	Mr Tony McWalter
Mr Mark Hoban	Geraldine Smith
Dr Brian Iddon	Bob Spink

The Committee deliberated.

Draft Report (The Office of Science and Technology: Scrutiny Report 2002), proposed by the Chairman, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 49 read and agreed to.

Resolved, That the Report be the Seventh Report of the Committee to the House.

Ordered, That the Chairman do make the Report to the House.

Ordered, That the provisions of Standing Order No. 134 (Select committees (reports)) be applied to the Report.

A paper was ordered to be appended to the Minutes of Evidence.

Ordered, That the Appendix to the Minutes of Evidence taken before the Committee be reported to the House.—(*The Chairman.*)

[Adjourned till Wednesday 23 October at Four o'clock.

LIST OF WITNESSES

Wednesday 15 May 2002

THE OFFICE OF SCIENCE AND TECHNOLOGY

APPENDIX TO THE MINUTES OF EVIDENCE

MINUTES OF EVIDENCE

TAKEN BEFORE THE SCIENCE AND TECHNOLOGY COMMITTEE

WEDNESDAY 15 MAY 2002

Members present:

Dr Ian Gibson, in the Chair

Mr Parmjit Dhanda
Mr Tom Harris
Dr Brian Iddon
Mr Tony McWalter
Dr Desmond Turner

Examination of Witnesses

PROFESSOR DAVID KING, Chief Scientific Adviser to the Government and DR JOHN M TAYLOR, Director General of the Research Councils, examined.

Chairman

1. Order, order. Professor King, Dr Taylor, thank you very much for finding time to come to see us. You are probably aware of some of our excursions into the scientific undergrowth in this country and we have lots of information we should like to try to get out of you to find out what is going on in science. Thank you again. As you know, comprehensive spending reviews are coming up, cross-cutting reviews and so on. I am very mindful of a great man who sat in front of this Committee once called Sir John Cadogan, who single-handedly, he told us, had saved British science by getting the budget right. Are you up for getting the budget increased in comprehensive spending reviews and what are the results of the cross-cutting review?

(*Professor King*) May I say how I think it would be better for us to divide ourselves in answering you? The cross-cutting review which Lord Sainsbury has now sent to the Chief Secretary for his consideration was prepared as a piece of divided labour. So that part of the cross-cutting review which refers to the spending of the Research Councils not unnaturally fell to John Taylor. Questions on that part of the cross-cutting review which refers to the work of Government Departments in Science would properly be directed to me. I would suggest that John should start and then I will take over.

(*Dr Taylor*) There is a lot of coupling between the cross-cutting review and the Spending Review and the Roberts review and the transparency review and so on. I think there are three main segmentations which we are trying to characterise and clarify for people. The first has to do with the extent to which the research we do in UK universities is underfunded to the extent that the full costs are not apparently being met by the money being sent. The second area has to do with salaries and stipends and the international competition for talent and that is relevant to Roberts. The third area has to do with the fact that notwithstanding the other two, we still need to increase the real volume of first class science research which we are doing in the UK, to keep up with the international competition and to go for the wonderful set of research opportunities which are out there and are out there with a fairly critical time fuse on them in many cases. The cross-cutting review is aiming to characterise that whole funding package set of issues. It has taken us into the dual support system, which is really a quintuple support system and to trying to understand whether one or other stream of funding needs to be increased and in what kind of way: should we be sending more money through the research assessment exercise, should we be sending more money through overheads on Research Council grants, how do we cope with the fact that the original research assessment exercise funding, the so-called QR money, was originally part of the dual support system and the other part of that system was the Research Councils? Since those days, charities, other Government Departments, EU, companies and so on have all tended to increase the funding radically and this underpinning has been stretched thinner and thinner. The cross-cutting review is really aiming to characterise that problem and inviting people to think about how to solve it. The Spending Review is really aimed at saying we need to do that, but we really also need to increase the amount of real resource and real volume of research we are doing properly funded. We also need to make sure that as the competition for international talent gets tougher and tougher, we are in a position to continue to win it.

2. Thank you very much. I thought I heard Professor King say that it had been sent to the Treasury.

(*Professor King*) Yes.

3. So it is published somewhere.

(*Professor King*) No.

4. Come on. You are tempting us now. Why is it not out there in the public domain at the minute? Why can it not be seen? Who has seen it?

(*Professor King*) You are the politicians so I am sure you understand.

5. You are not too bad yourself.

(*Professor King*) The cross-cutting review itself is the property of the Treasury and it is the Treasury which is considering, for its own matters in terms of funding, exactly what they will do. What Lord Sainsbury did, was to instigate the process, but it was assisted by the Treasury and I do believe the correct answer is that it is the Treasury's property.

6. Will it ever be published, as far as you know?

(*Professor King*) Yes.

[**Chairman** *Cont*]

(*Dr Taylor*) My understanding is that it will be published in some form as part of the process of the Spending Review. It is entirely up to the Treasury I guess as to what it decides to publish, but I believe the intention is that a version of that will become public.

7. Could you further tell us what the major factors were to emerge without ending up in the Tower of London overnight? Perhaps you could indicate to us how it fits in with some of the things we are all passionate about achieving. Can you say anything at all on that front?

(*Professor King*) In terms of the general tenor of it, we are very positive about the benefits of investment in science for the nation as a whole, whether it is for the wealth, or health, or whatever the benefits. I am sure you would not be surprised to hear that we are very keen to see that what has been a successful period of increasing funding in science, something like 7 per cent per annum in real terms, is continued into the next round. We are seeing a very significant return on that investment in terms of spin-out companies, in terms of interaction with industry and there is a strong case to be made.

8. I know you were very keen on having a charm offensive amongst all the different Government Departments and trying to get them to operate together. Can you say how successful you have been on that front and whether that will be a plus for us in terms of the Comprehensive Spending Review? The Government likes partnerships and interaction and does not like some of the mess-ups we have seen in the past. How is it looking?

(*Professor King*) I certainly see one of my functions as Chief Scientific Adviser to be to deal with trans-departmental issues. This is really why for Lord Sainsbury I have been participating very heavily in the review not only of the level of funding for research in different Government Departments, but perhaps more importantly the quality of the research and science which is conducted in those Departments and the quality of policy advice that is emerging from each Government Department. We have undertaken quite a detailed review and that has been fed into the Spending Review. We are looking at areas of overlap. We are looking at gaps in research areas where different Departments expect other Departments to have done it. The issue of quality has been very much at the top of our minds. What has already emerged from this is the appointment of a Chief Scientific Adviser in DEFRA.

9. Is that Professor Dalton?

(*Professor King*) Professor Howard Dalton. For the first time that Department now has a Chief Scientific Adviser who is directly responsible to the Secretary of State in that Department for all science aspects of the Department. I am keeping an eye on these Chief Scientific Advisers in terms of a group which I have been meeting, so that I can carry out my responsibility to the Prime Minister in that way.

10. This is novel really and quite radical in a way. You have been able to achieve that and we shall be moving forward. We can never say we will never see some of the calamities again but are you confident that you have broken the back of the problem?

(*Professor King*) Perhaps I could come back in two years' time. In the short period we have had, one could not anticipate breaking the back. If you are asking whether we are moving strongly in the right direction, I would very confidently say yes.

Mr Harris

11. May I ask about European funding? In your own opinion, do you think Britain has had a reasonably good deal out of Framework 5?

(*Professor King*) Framework 5 rather than Framework 6?

12. My understanding is that Framework 6 has not been finalised yet. The current one is Framework 5.

(*Dr Taylor*) The general answer to that is yes. If you measure it crudely in terms of how much money came back from the programme as opposed to how much went into the programme, the balance is positive. There have been many useful collaborations and fairly applied research activities going on through Framework 5.

13. What has OST done to encourage involvement by the UK scientific community? Has the OST done anything specifically positive to encourage that involvement?

(*Dr Taylor*) Over the last two years or so we have been developing the ability to encourage and co-ordinate that process quite seriously and it is one of the items on the agenda of Research Councils UK (RCUK), which started operation this month. That of course is being focused primarily on Framework 6. Framework 5 is a fairly responsive mode kind of activity where people join consortia and apply to the centre. The rules in Framework 6 and the processes in Framework 6 are going to be seriously different. We are taking quite a lot of steps to become much more proactive from the Research Councils and OST in helping UK participants get involved in forming consortia and so on which might play key roles in implementing Framework 6 when it starts next year.

(*Professor King*) We did hold a very big and well-attended conference which Lord Sainsbury launched and which Commissioner Busquin attended and spoke at here in London on Framework 6. Almost every university sent delegates to that. We are giving information out as to what route should be followed in order to get the best benefit from that.

14. There is obviously quite a lot of thought going into Framework 6 at OST. Have you decided what your priorities should be for Framework 6?

(*Professor King*) Yes. The state of negotiations is such that the British set of priorities has already been discussed and agreed on. We have reason to feel rather pleased with the outcome. Certainly Lord Sainsbury got much of what he wanted in terms of priorities in the first round of negotiations and then in the second round was persistent about those he did not get in the first round. The agreement which is now under discussion in the European Parliament—it has been through the Commission—has been very strongly influenced by the British position.

15. Can you tell us exactly what those are?

(*Professor King*) Yes, I could if you give me a moment.

Chairman

16. While you are looking, could John Taylor answer a question from me? Have you had any feedback from the Treasury whatsoever? Are they on board? Is it at the top of the pile, the bottom of the pile? Do you have any indication at all?

(*Dr Taylor*) It is very difficult for us to give you any kind of reliable information on that. At this stage, we are at the point in the process where things have gone in and a whole load of deliberations are going on. We really do not know at this stage how things are going.

17. I did read in a Sunday newspaper—they were trying to usurp you—that you were supposedly mad or something. Was that just idle gossip in the Sunday newspapers?

(*Dr Taylor*) I read that as well and I found it fascinating. I have had no participation in any such discussions. I have no idea where that story came from.

18. There is no truth in it as far as you are aware?

(*Dr Taylor*) We are working very well with the Treasury. The whole question of developing that package of things which I told you about earlier on is going very well.

Mr McWalter

19. Are you of the opinion that this whole way of doing things actually cuts out a lot of expertise and a lot of knowledge, because you have this secret business going on, then somebody comes down with tablets of stone and announces the result? Are you of the view that the process itself is flawed, particularly in the case of science, where the expertise is so widely distributed and where so many people have a very valuable contribution to make?

(*Dr Taylor*) I cannot comment on any other parts of Government and the process they have with the Treasury, but I will speak on science. I am very pleased with the progress we have made over the last two years in the run-up to launching Research Councils UK. We have run the process for Spending Review 2002 in the kind of way that we want to move towards. We have used the expertise of the councils and their communities very extensively in putting together the proposals. We have debated those around the table of the Chief Executives and myself. I am very pleased with the improved quality of advice that I am getting from the Research Councils about the programmes we should propose and the reasons why they are important and the reasons why we are managing our affairs efficiently, effectively, tightly, to justify additional funds in addition to the changes we can make from our current resources. We have said as part of the quinquennial review and the launch of RCUK that we will progressively put out the combined view of our strategy, the landscape, the whole portfolio that we are currently funding and that we in the Research Councils are looking at in our five-year forward look. That will be progressively visible as a single thing right across the patch rather than the six or seven separate things. So that has come from the Councils and their communities. It is visible and discussed across the Councils and their communities. It forms the basis of the advice to me and that in turn forms the basis of my advice to the Secretary of State and Treasury on what we should actually ask for.

(*Professor King*) The total budget for the next four-year period is €17.5 billion and the budget is focused on seven thematic priority areas. I can give you the figures under each one, if you would like, or should I just tell you?

Chairman

20. Could you send them to the Committee and we will distribute them?

(*Professor King*) Very simply, the key areas are biotechnology for tackling major diseases, next generation internet, aeronautics, nano-technology, cleaner energy. These are all high priority issues for funding in the UK. In terms of flexibility, there is sufficient flexibility in the programme to meet a whole range of other areas as well.

(*Dr Taylor*) The challenge for us in the research community now is to see, given those areas and those allocations in funding, how we can help the UK community to get the most leverage, the most contribution in certain of those areas. Where is the UK really going to major? Where is it going to take part, minor roles, and so on? That is what the next round of things is all about.

21. May I just finish the arena I was probing with you? What happens now? Do you just wait for the answer to come back? Is there an ongoing series of negotiations? Have you done your dirty work now and do you just wait to be called in or do you still negotiate?

(*Dr Taylor*) The answer varies across the patch. The cross-cutting review is a report which has been submitted and we shall see what happens, what kind of response comes from Ministers.

22. Do you anticipate a response before the Comprehensive Spending Review is announced in the House?

(*Dr Taylor*) We do not know and I do not believe there is any public timetable for the sequence of these things. All I expect is that we shall hear the ministerial response to cross-cutting review as part of the overall Spending Review process, but exactly which will precede which I do not know.

(*Professor King*) The Spending Review White Paper, if we go by the previous White Paper, appears in July. We might anticipate that sort of timescale.

23. Is it a done deal for British science now or do you think there is still a chance to lever into the political process?

(*Dr Taylor*) On the Spending Review issues, clarifications, additional pieces of input are possible but essentially the process of saying this is really what we are looking at is pretty well done. In the case of the Roberts review, I believe a governmental response to that will be produced, but again I am not sure what the timing of that is going to be. That will obviously also have Spending Review implications.

24. So there are people beavering away and they are taking all this and compiling some response for the Chancellor to come up with. Is that what happens?

(*Dr Taylor*) I could not comment.

[**Chairman** *Cont*]

25. It is a bit strange that we do not know the process, is it not? We are scientists, we want to know how these processes work and we want some feeling for the stages which take place. You have done your work and are left in limbo.

(*Professor King*) From our point of view we have had an opportunity to put a very robust case forward and we have been involved in those discussions very deeply.

26. At what level in the Treasury have you done that?

(*Dr Taylor*) In the case of the science and research part of things, from the Chief Secretary down.

27. Has the Chancellor been involved at all?

(*Professor King*) No; not at this stage.

28. He has not directly been involved?

(*Professor King*) No.

Dr Turner

29. OST, that is yourselves, recently commissioned a report from JM Consulting on science research infrastructure. In the best journalistic traditions Nature reported the contents of it last month. Nature tell us that the report identified widespread deficiencies. Are you able to confirm that is the case? Are you able to confirm the figure that UK university laboratories need £3 billion of investment to bring them up to the standards of the twenty-first century?

(*Dr Taylor*) As you say, we commissioned that work from JM Consulting. The overall situation is a fairly well accepted one from the Dearing Report, from the results of the transparency review. There is a serious level of under funding. The detailed interpretation of those numbers is quite a technical and variable undertaking. Whether or not I want to confirm a particular number from the JM Consulting report as being the definitive correct number, at this stage I am not willing to say that is the number. That is one of the inputs; there are various inputs and various opinions about how to characterise the number. It depends for example how you really want to account for depreciation on buildings and the value of the estate and the use of capital, cost of capital figures and so on. There is a wide range of ways of looking at those data.

30. Surely what matters is whether the research infrastructure in any universities is going to be adequate for immediate and future demands or whether, as is alleged to be contained in the report, it actually threatens our scientific future as a nation.

(*Dr Taylor*) If you look at what has happened in the last two cycles with first of all JIF putting £0.75 billion in and then SRIF putting a similar order of money into an investment fund for science research infrastructure into the universities, that tells you first of all that the argument that there is a serious deficit is accepted and the recent data from the JM Consulting report reinforces the fact that there is still a sizeable problem. We can debate exactly what the number is, but there is still a sizeable problem. The position that most people would take is that SRIF was better than JIF and SRIF is something that it would make a great deal of sense to continue. That kind of approach to renewing the infrastructure progressively is something which seems to be a very sensible way to proceed.

31. JIF and SRIF between them have only benefited 15 per cent of the laboratories. That clearly implies that there is still an awful lot to be done because it has been mainly sexy new projects which have been funded through it. The report allegedly states that JIF and SRIF have not in fact had much impact. Do you agree with that alleged finding? If so, are you considering any alternative approach towards addressing the infrastructure problems?

(*Dr Taylor*) Let me comment on your remark about the sexy new projects. I do not think that was the intent or the effect of JIF and SRIF. The basic intent was to renew the infrastructure for the very good research groups, the best research groups, not to start new groups. This was not about new recurrent expenditure for new people. This was about facilities and equipment and buildings for existing people. I know people like to think of it differently, but that is the fact. Secondly, I think that putting in something of the order of SRIF plus JIF, which is of the order of £1.5 billion, but let us give you the right number, over a period of three, four, five years, must have had a serious impact, or will have had a serious impact when it is in place, on the kind of situation which is described in the JM Consulting report. It will not be possible to renew all of the infrastructure in all of the universities which do any kind of research on that kind of time frame. The capacity is a real issue in that case. What we are looking at is continuing this programme on a stable basis so that universities will be able to plan for the kind of funding that they can expect and ensure that funding is spent on renewing infrastructure and not on extending the volume of research which is being done.

(*Professor King*) May I address your question as well and pick on the general tenor of it? First of all, just to make an historic statement, the under-funding which occurred within the higher education institution system over a very long period of time—I would say going back to the early 1980s—has produced the effect that we are now looking at. Over that long period of time, what was funded was recurrent demand and what was not funded was upkeep of infrastructure, to make a very general statement. What we have seen post these two three-letter and four-letter funding efforts, JIF and SRIF, is that there has already been a very significant transformation. I would say the 15 per cent figure which you quote is not giving a fair impression of what you would see if you travelled around the research intensive universities in the United Kingdom. Certainly I have a programme of visiting higher education institutes and what I see is that morale is climbing as a result of the infrastructure improvements which have occurred. On the ground, you will find enormous differences have occurred in specific institutes and in specific science departments. There is a big job still to be done.

Chairman

32. Would you like to name any of those?

(*Professor King*) I should like to name the Chemistry Department at Cambridge for example, which won a £28 million grant to refurbish the

[**Chairman** *Cont*]
building in the first round, the JIF round. I have to say that the total refurbishment cost will be something like £52 million and the rest was raised from industry and from the university's coffers. That cost sounds like quite a lot of money, but was vitally necessary to create a modern laboratory which is one of the world's leading chemical laboratories. St Andrew's is my most recent visit and they were opening their new laboratories. Nottingham has done well. There are a wide range of universities where the benefits are already beginning to appear. I do not want to sound complacent. I agree absolutely with what John was saying. We have years ahead of us to recover fully from a period of severe under funding.

Dr Turner

33. Are you satisfied that we are getting the bang for the bucks with that money, that it has been wisely and well spent?

(*Professor King*) I believe that if you looked into any one of those Departments where the money has been spent, you will find that morale amongst scientists is high, that the standard of science is improving in those areas and that to me is bang for the bucks.

Dr Turner: Will we all be able to read the consultants' report? Is it going to be published?

Chairman

34. Do you have copies with you?

(*Dr Taylor*) We do not have copies with us.

35. Would you make them available to the Committee?

(*Dr Taylor*) Let me take notice of that question.

36. When will we get an answer?

(*Dr Taylor*) I am told it is already published on the website.

Mr Dhanda

37. I just want to pick up on one point. Is there an over onus on red brick, Cambridge, St Andrew's, Nottingham? All very nice, all very good, but very red brick.

(*Professor King*) The answer to your question is that the JIF and SRIF grants were competitively awarded and it is therefore no surprise to find that in general there is a strong correlation between where the money went and the research assessment exercise rating.

38. There is no correlation between people who are particularly adept at putting those bids in because they have done it before and been very good at it.

(*Dr Taylor*) Let me comment. JIF and SRIF were quite different. JIF was competitive. I chaired the board which made the awards right across the patch. It was competitive on a very narrow basis in terms of the absolute quality of the people who were involved in those Departments and those activities. SRIF was done much more on a formulaic basis. This is part of the transition that we hope, Spending Review permitting, we can continue. Formulaically the university is told for the Spending Review period that it is going to get this sum of capital money that it may only spend on capital science research infrastructure, so it can start to plan. That is a much lighter touch. One of the things we did in the SRIF round this time was to have a dialogue with the universities about their strategies, their directions, what kind of serious infrastructures they need to put in place with some of this money. We need to tell them where we think some of the science budget and Research Council money is going to go because some of the research which the Research Councils plan to do will not be doable unless the universities put in place the right kind of science infrastructure to win the grants to do it. We are in the process of developing that kind of dialogue which on the one hand gives the universities considerably more autonomy in how to spend that capital money but say it must be spent on capital, not on increasing volume. It means that we have to have more of a strategic dialogue about where we think things are going to go and where they think things are going to go.

39. I am sure the Committee would be interested in a list of applicants for those grants.

(*Dr Taylor*) Let me be clear. The SRIF process is an allocation to each higher education institution. In that sense, there is no application for a grant. There is an allocation of money and there is some light touch dialogue about what they plan to spend it on. It is not a question of them competing against each other. JIF has finished, has gone. There are widely published lists of all the JIF grant recipients.

Chairman

40. Are there barren areas? With the Lottery funding there are areas where people do not have the bottle to go for it or the wherewithal. Do you find that is true in the universities? Are they all up for it?

(*Dr Taylor*) One of the reasons why in the first round of SRIF we pushed hard for a relaxation of the university contribution to plans for doing joint projects between institutions was to encourage institutions to think bigger and to make sure they had the space in which they could say, "Hey. By ourselves we could not possibly contemplate doing this, but if two or three of us got together we might and by the way, if we did, would we get a discount in terms of the need for us to find additional funding".

41. Universities are not well known for working together at that level, in fact the whole system has been to compete with each other. We shall come to the RAE shortly. How has it worked in terms of that?

(*Dr Taylor*) The answer is that it is early days, but that is the kind of direction in which we are trying to move and that is the kind of encouragement which we are trying to give to more dialogue and co-operation between departments where it makes sense.

(*Professor King*) Your question could also be answered by referring to a common interest of ours, which is football. In the Premier League we do have competition.

42. You are digging me because we lost on Sunday, are you not?

[**Chairman** *Cont*]

(*Professor King*) Yes. Within the Premier League there is also collaboration about deals with television and so on.

43. You take my point. If you are not in the Premier Division and you are in Nationwide, you can lose out if you do not have those affiliations. Some universities will seek to work with each other and not with others. Do you accept there is a climate of that? I am just asking how it is working to avoid that kind of competition? In the Regional Development Agency it would make sense for Cambridge, Norwich, Essex to work together. I bet you it does not happen.

(*Dr Taylor*) Indeed, as you know, in the North West and also the North East, we have really encouraged the formation of the regional science councils and they have been getting some of the major and minor universities together round the table with other key players in the region. Those two are really good examples of how encouragement for universities in a region to sit around a table and discuss how they can do some things together, which would really make sense for us, is actually paying off.

Mr McWalter

44. I do think that there are some universities who clearly do not have the inside track when it comes to having the FRSs and so on to push their case and to give them a high profile. Sometimes that comes out in funny ways. For example in the computer science RAE, those universities which did very fundamental computer science tended to do very well in terms of assessment, whereas those who tended to apply computer science, which is less the territory of the FRS, tended to have significantly lower gradings. It does just worry me that with some of the projects, if for instance you have some people with that expertise perhaps really in the front except it is not known by those who are making these decisions like yourselves, what then happen is that their new exciting applied computer project will get marginalised in the process, their bid to get an appropriate facility for it will be downgraded relative to the places where they very much have the inside track—Russell Group universities or whatever. In short, do you think that this whole process is really fair to all the potential stakeholders?

(*Dr Taylor*) You have asked quite a complex question. Let me try to tease apart first of all the infrastructure and facilities and then the research grants and the RAE because those are three quite separate strands.

45. Try to indicate the way the same mechanisms can run through.

(*Dr Taylor*) In SRIF the allocation of money for infrastructure is made formulaically to the university and it is a question essentially for the Vice Chancellor and his colleagues as to what kind of infrastructure they intend to produce. We are trying to be available for the dialogue to give our views about the things we think are important. If you take computer science as an example, we have recently conducted an international review of the computer science research that we fund because we really wanted to get a clear outside, overseas reading of where its strengths and weaknesses and so on were. We do not rely on the research assessment exercise for those kinds of things. What we do in the Research Councils is to peer review grant proposals to do particular areas of research. We provide the peer review community for that. That is essentially stand-alone from the RAE exercise. Each one is looked at on its merits and by peers in the community and we work quite hard to try to make sure that peer review process is as good as it could be. We do not allocate Research Council grants according to the RAE standing of the university groups which make the applications.

46. And it is not the same people doing both?

(*Dr Taylor*) You would be surprised if there were not a reasonable correlation between people getting high ratings in the RAE historically and people making grant applications for future work. There is a tremendous dynamic in where groups lie, what departments they are in, what kind of new multi-discipline things are coming along. It is important that you understand that the RAE is a retrospective look at the last five years and the people who were in those places in that time. What we do in the Research Councils is to assess the proposals for people for future work and whether or not it should be funded. The groups which make those proposals may or may not relate closely to the groups which got those ratings in the past.

47. The closer the correlation gets to one, the more suspicious I am.

(*Dr Taylor*) Of what?

48. Between those different groups. Clearly there would be a correlation; I accept that. If the correlation is in fact that it is the same people or very nearly the same people, that obviously does mean perhaps that diversity, new fields, people, relatively young academics and all those other areas where what we really want to see is the tender shoots being given the appropriate nutrition . . . We are quite conscious that new enterprise can sometimes be strangled at birth and sometimes the form the strangulation takes is not to grant people the appropriate infrastructure.

(*Dr Taylor*) Two points are quite important in what you have said there. On the one hand we are trying to keep people talking about groups and departments rather than universities in our community because making blanket statements about whole institutions runs rather counter to the question of where the really best groups are and where new things are starting to happen. The other question which some of my Councils are looking at very carefully, is instead of insisting that each bright young new researcher goes through the process of applying for a grant or getting someone to apply for a small grant for him or her to do what they want to do, in a number of cases, if you take a fairly large, really top class group, then you should be saying to the key people in that group, "You should be taking risks on bright young people on your own account. You should be funded so that you have a certain amount of money so you can say you will let someone work on this idea for 18 months without having to wait 18 months for a grant application".

Dr Iddon

49. Going back to the Comprehensive Spending Review, we were quite pleased by the last one in that it gave an uplift in science funding. Then we discovered that in the State Departments there had been a consequential downfall in state funding, particularly in MAFF as it was then, and perhaps that made the whole thing negative, which disappointed us. Are you involved in the arguments about state departmental funding as well as overall funding for higher education and everything else?

(*Professor King*) Yes. The answer is that in that part of the Spending Review which I was most heavily involved in we were looking at departmental research funding. You raise a very good point. The funding of Departments is static; it did drop from the period of 1986 onwards. It has now risen a bit; it is fairly static. My main point is that we need quality, we need fitness for purpose, we need good advice coming through Departments. Once quality and fitness for purpose are excellent I believe funding will flow much more naturally into those areas. My focus rather has been on getting that side of it right and then arguing for the funding to flow after.

Dr Iddon: This might be a difficult question for you. Are there any particular State Departments which you are very worried about?

Chairman

50. A yes/no will not suffice.

(*Professor King*) That is why I am hesitating even to answer.

51. We would settle for that, if you would say that you are worried.

(*Professor King*) The answer is yes.

Dr Iddon

52. May I turn to higher education funding now which is a particular concern of the Committee? May I say before I begin my questions that I was at Liverpool and had the privilege of opening a £2 million scheme a fortnight ago of newly refurbished laboratories in your old department, in the Robert Robinson laboratories in fact. That was spectacular and it had lifted the morale of the whole department. This refurbishment which is going on is really critical for lifting science in the UK. I just wanted to underline that. I may also say that I saw one of the refurbished teaching laboratories and it was spectacular by comparison with the former teaching laboratory and Liverpool has found the money out of the rest of the money we are beginning to talk about now, not from SRIF and JIF funding. That was an interesting visit. Coming to the research assessment exercise, we are very anxious about this. Already I am hearing very serious stories coming out of universities. I am from the North West. I hear a serious story about what is happening to science at Salford. I hear about the potential collapse of some science at UMIST. This morning I have heard that there might be 70 jobs going across the whole university not just in science at Manchester. I put it to you that it is not just a shortfall in the research assessment exercise funding, that was £20 million extra given by the Minister for Higher Education, Margaret Hodge; in fact our report published recently showed that the real figure should be about £206 million. It is not just about the shortfall in funding to meet the new research assessment exercise results last year, but scientists are telling me that in science inflation races ahead of inflation in general. The real losses are greater than the figures suggest. What are you doing to argue with your Treasury colleagues, in what I regard as a crisis now, particularly in my subject, chemistry—yours too, Professor King? I think the same could be said of physics. Are you having any influence on the Treasury with respect to this shortfall in funding?

(*Professor King*) First of all let me pick up a very interesting point you make about inflation being higher in the sciences than in other areas. The answer is yes, we are very much aware of this and this point is being made. As we move up in terms of capabilities with computers, in terms of capabilities with the instrumentation, if you want to keep up with the top science happening around the world—nuclear magnetic resonance spectrometers, for example, get more and more expensive—that argument has been made. There is another argument and I come back to infrastructure. I made the argument at Liverpool and subsequently at Cambridge that a normal building, let us take a building where history is taught for example, requires 2 per cent per annum of its capital cost to be spent on refurbishing it. For a chemistry building, a physics building, materials science building, it is more like 4 per cent. You have to acknowledge that the wear and tear on a building with experimental sciences is greater. That is a problem which had not really been recognised in terms of continuing funding, that modernisation and refurbishment have to be seen as part and parcel of normal expenditure. We are still in the recovery stage and we are very pleased to hear your account of Liverpool, but we are still very much at the recovery stage. In terms of shutting down, I do not think this is all a shortfall on the HEFC funding through the research assessment exercise system. I think another factor is the very worrying factor that the Gareth Roberts' report has highlighted, which is the swing against the physical sciences; the number of students registering for degrees in the physical sciences is actually dropping. If we see departments closing, that is the essential driving force. However much the Government decides—and I believe the Government is moving in this direction—that science is worth funding, it is a good investment, if we do not attract young people into science as a career, we are not going to win out in the end. I do see that as a critically important problem.

53. I hear rumours now that some Vice Chancellors are arguing against the 1.75 ratio of funding in universities. You know what I am talking about. Is there some real pressure from some Vice Chancellors to reduce this 1.75 figure? I do not know whether all my colleagues are aware—I think they are—that science is funded higher by that ratio than the arts subjects and some Vice Chancellors are arguing that the figure be reduced because they are finding it difficult to fund science departments.

[**Dr Iddon** *Cont*]

(*Dr Taylor*) I would not want to speak for Vice Chancellors in general. I am certainly aware in some other non-science research environments that people are saying they need more expensive infrastructure to do, for example, some of their creative design or arts and humanities research. It may be that people from other disciplines are arguing that the costs of their research and the infrastructure needed for the research are becoming more expensive than they traditionally have been thought of. They are no longer just paper and pencil or library based activities. Just a couple of points on the RAE situation. It is very important to remember that the process of allocating the grades and the process of plugging those grades into a formula which decides an allocation to a university are separable processes. The cycle of the five-year RAE process of assessing those grades is not particularly closely coupled to the cycle of the Spending Review, providing money to operate that formula. That has been a very clear open situation. It is very clear that in the last Spending Review, there was no provision for anticipating the review at this stage. There is a cycle synchronisation issue. The issues you describe are central to some of the cost cutting review debates. We are very exercised about how that part of the dual funding system should proceed. It is also very important to remember that the formula produces a grant which is given to the university, to the Vice Chancellor, for he or she to allocate as they judge fit. So there is no real close coupling between a five-star department which got a five-star rating and funding which flows to that department in the next five-year cycle as a result of that. It is entirely at the Vice Chancellor's discretion and decision.

54. There are also rumours circulating that we ought to support 20 chemistry departments. I just take chemistry because that is a subject I know well. You could translate these arguments to physics and the other sciences I guess. Some people are saying now that there ought to be 20 chemistry departments around the country and that is all we can afford to support with the current amount of money. I would put it to you that with local industry and more students living at home now, we have to have a chemistry department to which all the potential students can travel. Would you resist this argument as I do?

(*Professor King*) We are now talking at the level of what is a university. If you start axing core subject departments from universities you are beginning to attack that problem. You will not be surprised to hear that I am tending to favour your position. At the same time, we have to recognise that if student demand is not there, we are not going to keep the departments all open. So I come back to the demand from students being a critical factor. We are covering two questions here, which is research support, which is what John and I are really here to talk about, and teaching support. It is the educational side which we would all want to see in our universities in the round in the regions and around the country. There are two issues: one is education and the other is research.

55. Do you think we are returning to the binary divide? I was one of these people who resisted the argument that all polytechnics, irrespective of quality, should be converted into universities. I think I was right, because I now see that we are creating a new binary divide in the university system. With over 100 universities we are concentrating the money and concentrating the other resources and concentrating the best students in fewer and fewer universities, leaving a trail behind which is converting us back to the binary divide, which I think would be disastrous.

(*Professor King*) It would be disastrous to return to the system we had before. What I would say is that an aspect of the research assessment exercise which I supported very strongly at the time and I still think was right, was the department by department evaluation rather than institution by institution. If you go back to the point where the RAE was introduced that was what was under debate, whether there would be a list of top 16 or top 20 universities. That did not follow through and what we have had is a considerably better system, because it has allowed departments to evolve. What has evolved in the United Kingdom is now a very effective research system in our universities. I would certainly defend that. If you then ask whether we are slipping back to a binary divide because willy-nilly we have now got a Russell group of universities, there are universities which have many more five-star departments than others, there is a bit of a divide developing. This is a subject for discussion and debate now. Where is the research assessment exercise going? Did the RAE serve its purpose, get us to the position we are at now and now we have to re-examine the whole issue? I think the answer is yes, we do need to re-examine it.

Chairman

56. You will know that we just put out a report which has really struck a chord with the academic community anyway, not particularly with Howard Newby at the minute, but certainly with the academic community. Just to follow up on the business of department funding, you talked about fitness of purpose and the funding will follow. That does suggest you might miss out in the current round of the Comprehensive Spending Review as far as some departmental budgets are concerned. Is that right?

(*Professor King*) Thank you; I may have been misunderstood. I am pushing for quality and fitness of purpose and the reason I mentioned fitness of purpose is that if we take the research assessment exercise, there it was international quality of research which was the metric. We cannot simply apply the same metric to Government Departments because there the other factor is fitness for purpose. We are trying to determine ways of achieving what was achieved through the research assessment exercise with Government Departments but now taking account of fitness of purpose. I do not want to suggest that I am therefore indicating that we should see a fall in research funding or science funding for all Government Departments. Far from it. I am trying to say that we are going to raise the level, both from the quality and fitness of purpose viewpoint and therefore this justifies further funding.

Mr McWalter

57. I should like to ask some questions about the actual operation of the Department. The DTI set out various objectives and targets called public service agreements which were published after each Spending Review. Only two of your 12 targets seem to apply directly to the Office of Science and Technology. One is to improve the overall international ranking of the UK science and engineering base—target 5—and target 6 is to increase the level of exploitation of technological knowledge derived from the science and engineering base. It is basically: get higher in the rankings and do more exploitation. These are of a pretty general nature. Do you yourselves, as opposed to the Department of Trade and Industry, actually have more detailed performance targets than these?

(*Professor King*) We are of course within the Department of Trade and Industry and we have been heavily involved in the restructuring of the Department which is taking place. Certainly if you read through the other objectives of the Department in its restructured phase, you will see that innovation is very high on the agenda: the emergence of the notion of successful exploitation of new ideas in UK business and the emphasis on use of our strength in the science, engineering and technology base to further the process of innovation and to strengthen the research base in industry.

58. Wherever I see the word "innovation" as in Innovation Group, it is really science and technology, is it?

(*Professor King*) Yes. Interestingly the group was originally called Science, Engineering and Technology Innovation. The Secretary of State decided that one word was enough for each of the new groups. Many of us had some sympathy with that. Certainly the Innovation Group which is the new group in the DTI is focused on the pull of new technologies, new science, emerging from the science and engineering base.

(*Dr Taylor*) I was asked to lead the process of helping to design the Innovation Group. This model of science push/industry pull is one of the key things this is designed around. We felt it was really important to get somebody at Director General level in the DTI whose job is focused around innovation. Innovation is much more widely drawn than just science and technology, but science and technology is a key part of that process. The new Director General will also be the Chief Scientist or technologist or engineer, whichever, of the DTI. The DTI has not had such a position for quite a long time. The process of how new industry in the UK, growing industry in the UK, really pulls not only on the UK science base, but the global science base, is one of the key things that the Innovation Group needs to work on. Certainly Dave King and I are committed to working on this new Knowledge Transfer Steering Group with the new DG and the DG of business in DTI to co-manage this science push/industry pull process in a much more coherent way than perhaps we have managed to do so far.

59. So there is a new restructured DTI which has science and technology much more in its centre and at its core, although it has got shy about it and does not actually make that clear any more. You talked about the DTI's targets in this restructured state but have these objectives in the light of that been re-issued since the restructuring or do you still have the bland 12. Because of the restructuring you obviously have a greater sense of purpose. How have you changed those objectives? Are they in draft somewhere or in a secret document that we are not allowed to look at?

(*Dr Taylor*) The process which is going on at the moment is that the new organisation has just been launched and it is just getting into its first planning cycle, its first strategy cycle. It is going to have a new strategy board, it is going to have a new executive board and so on. That process is something which needs to be worked through internally in DTI and externally with Treasury and the other interested bodies. I would not expect the new structure to have suddenly produced some new PSAs out of the blue. That is a process which will take a year or more.

60. May I say that in general I am quite pleased with what you have said? It is clear that the DTI have been insufficiently aware of the enormous dependency of trade and industry on the science base. If that is now being made much more explicit, I am pleased about that. One of your old targets used to be to improve the overall international ranking of the science and engineering base in terms of its quality, relevance and cost effectiveness. How, given that Roberts says that the number of people studying all these things is falling like a stone, are we going to deliver this without the people? It would appear that you do not take as detailed an interest in that as you should. You say somebody else is looking after that and you will only deal with the top end of the people who have come through who are available. How are you going to deliver that without a much greater emphasis on education?

(*Professor King*) I do not believe that we ignored that aspect at all. The Office of Science and Technology is very concerned about the skills base and Gareth Roberts' report is very much at the top of our minds, although we were very much aware of what was happening before the report was made. We do keep an eye on these factors.

61. So you have written some Roberts-type things yourselves, have you?

(*Professor King*) I have spoken about the problem and I believe so has John Taylor.

62. Have you written about it, because I should like to look at that if you have done prior to Roberts? Can that be made available? I have some nods from your advisers, so it probably can be.

(*Dr Taylor*) There is a plethora of things.

63. It feels as though Roberts is rather disconnected from what we have seen by way of OST publications and I am pleased to hear that there has been a much closer involvement here. That is very important but I should like to see the evidence for that.

(*Professor King*) Very much closer. If we look at the situation, we have been involved in trying to analyse what is causing this fall-away in registrations. As is made clear from the report, the fall is strongest in the physical sciences, is not strong in the life sciences. Interestingly registration of

[**Mr McWalter** *Cont*]
women in the life sciences has been increasing over the years, whereas the fall in registrations for men in both life and physical is about the same. What is keeping life sciences up is the registration of more and more women in that area.

64. It is girls' love of pets, is it not? I speak as the father of some.

(*Professor King*) No; it is the attractions of molecular biology, the genome. Biotechnology, molecular biology are very much in the news and this is a factor in attracting young people to that field. It is more difficult to see that actually developments in science across the board require support from computer technology, physics, material science, chemistry and the life sciences. I do not think one stands in isolation from the other. Yes, we are very, very concerned about what is happening and a lot of my own effort is to try to analyse and tackle the problem.

(*Dr Taylor*) From the Research Councils point of view I am on the council of HEFCE, I am a member of its People Issues Sub-Group, as well as its Research Strategy Committee, where we have been debating these issues from the research point of view back into the higher education domain. In OST and the Research Councils we have run major programmes on public understanding of science, now moving to science and society dialogue and the issue about reaching out into schools and communication with young people about why it is important and exciting to do science is very much on the agenda. If you go round any of the Research Councils you will find they have very active and actually quite effective programmes for facilitating and encouraging that. Also the new Innovation Group in DTI is going to take much more coherent hold of the skills agenda in the industry part of DTI than has been the case. There are many things which have been quite thinly spread around the DTI which are now going to be pulled together much more seriously. That is something we shall be able to talk with them much more coherently about through the Knowledge Transfer Steering Group (KTSG). In terms of delivery of our agenda in the short term, the other dimension of this is that we have to face the situation we have over this year, next year, the following year, because a lot of the other things we have been talking about will take a long time to come through. It is very clear that there is going to be an increasingly tough international competition for talent. If you see what the Canadians have just done, what the Americans and the Germans and the Japanese are doing in the area of saying they have to have more international people coming to work in Germany or Japan or Canada or whatever, that is a battle we have to continue to fight and to win in the short term if we are going to keep our programmes staffed.

65. One of your targets was to increase by 50 per cent the 1997–98 number of companies spun out from universities by the year 2001–02. It is awful the way these things come back to haunt you, is it not? Have you achieved those targets?

(*Dr Taylor*) Yes.

(*Professor King*) Way exceeded them.

(*Dr Taylor*) Way exceeded them, but we have also said that is not an appropriate target for us to run with. The target is modified in the terms that you read out earlier on. Just increasing it by 50 per cent is not a very meaningful thing to try to do.

66. It would be nice to get some evidence. We do not have access to that list.

(*Dr Taylor*) A report was published at the end of last year called Higher Education Business Interaction Survey which for example quotes 199 new spin-outs and start-ups from university departments in 1999, compared with an average of 70 a year for the previous five years. There is pretty hard data.

Dr Iddon

67. Do you have a survival rate?

(*Dr Taylor*) The survival rate of companies started up in 1999? We need to track it.

Chairman

68. How does it compare with Californian standards?

(*Dr Taylor*) There is a lot of data and statistics are thrown around about these things. One of the statistics—we can send you in correct numbers in case I read the wrong thing into the record—is that we have a much higher productivity in terms of start-up per million pounds of research spend. We are very considerably better than the United States' numbers in that area.

(*Professor King*) Let me give you those figures. We spin out one company per £8.1 million investment from the Office of Science and Technology in the research base. That compares with £12.4 million in Canada and £50.2 million in the United States per spin-out company. If we just count spin-out companies we are doing very well. We are now trying to improve the metric. What we need to do is look at value of companies. If you will excuse me mentioning Cambridge again, there are now five companies valued at over £1 billion each with a sixth about to cross the barrier.

Mr McWalter

69. Do these companies say it is because of you? Do they give you the credit for this or do you think this might have happened without you or much of it might have happened without you? There was a big emphasis in the previous Government on universities getting into enterprises.

(*Dr Taylor*) Many of those companies would say that a lot of the original activity which got them started came from public funding of the science research. One example which has been fairly visible just lately is Colin Sweeting and the Surrey Satellite. He very publicly says that the fact that he now has a £60-odd million business was due to some SERC funding probably 20 years ago which actually got the whole thing rolling and started.

(*Professor King*) I believe your question is correct in the sense that there has been a massive cultural change in our university system and it has taken place

[**Mr McWalter** *Cont*]
over a long period of time. What is now happening is that through John Taylor's work and the work of many others that process is being accelerated and assisted. The change was already happening.

Mr Dhanda

70. I do wish you would stop going on about Cambridge.

(*Professor King*) I apologise.

71. We have had some groups of letters, we have SRIF and we have had JIF. Since the quinquennial review we have had RCUK as well as a consequence of that, the Research Councils UK strategy group. How effective has that been, because it has only been around since 1 May? How are you going to measure its effectiveness in the coming months and years?

(*Dr Taylor*) The three basic areas in which we expect Research Councils UK to add value are: first, a more coherent approach to the whole spending cycle; the process of maintaining a more coherent view of the portfolio of research that we are funding; and where we expect to see that portfolio going both in terms of making proposals for spending reviews, making allocations of money in spending reviews and making much longer-term plans for major facilities. I expect to see the whole operation behaving more coherently and more effectively and more openly, more transparently in that process. Secondly, we intend it to be the single voice for the Research Councils and the single portal into the Research Council community wherever and whenever it makes sense to have one. It will be the focus for dialogue, for example, about Roberts with Universities UK and others about how universities manage infrastructure, careers, quality of research training and so on. It will be the focus for dialogue about international policies, what we in the Research Council communities think about having a European Research Council or collective representation in China and so on. The single port of entry. If you want to find somebody in the Research Councils to talk about this, it will be increasingly the one place you can go which will take you to where you want to be. If you want to know what the Research Councils think about X, Y or Z, there will be a place where it has been debated and thrashed out and articulated and made available. The third area is a more effective and more efficient operation. A more coherent interface to universities making grant applications, for example, areas where we could get more streamlining in the back office operations, more efficiency, more coherence in the way the Research Councils operate. Those are the three things we are focusing on as we implement Research Councils UK, get it up and operating and implement the recommendations of the quinquennial review.

72. Who is going to be responsible for measuring that and ensuring that it is all actually working properly?

(*Dr Taylor*) Essentially me, as the Chairman of that group and as the point where Research Councils are basically accountable and are funded.

73. A big job.

(*Dr Taylor*) It is one which we are tasked to do already, but in the previous *modus operandi* it was on a council by council basis. What we are really saying is that in many cases we believe the whole operation will be much more effective if we bring things together where it makes sense. We are not trying to undermine the individual councils or break up the huge value added they have as individual councils, but there is a number of areas where it would make a lot of sense, it will make a lot of sense, for us to do things together. Measuring the effectiveness of that will in essence be easier than trying to do it seven times over for seven separate councils.

Chairman: Last week we were asking about the Royal Society and the Royal Academy of Engineering. This is probably the one which has kept you awake all night. The question of the money going into fellowships and so on from OST. Why should that money go there and not to the Research Councils? Have you ever examined that question yourselves? It is big bucks in a sense: £20-odd million.

Dr Iddon

74. What does the Royal Society do that other organisations cannot do?

(*Dr Taylor*) The important historical *locus* of the Royal Society and more recently the Royal Academy of Engineering is that it is about individuals, it is an *ad personam* kind of organisation and it is about excellence. From the point of view of two key areas, they are organisations which have been quite effective for us to work with. The most important dimension from my point of view is this phrase "human capital". It is really important that we do everything we can in the UK to develop the very best talent we can. The track record of the kind of things that we fund through the Royal Society has been really very good. The important thing about the Royal Society and the Royal Academy of Engineering is that they are not discipline-based. They are not particular advocates for particular communities of chemists or physicists or other kinds of scientists. They are completely adisciplinary. That means that they are a unique kind of channel which we can use to develop human capital and human talent in a very open adisciplinary kind of way and in a way which is quite effective and quite arm's-length. Historically it has made quite a lot of sense to say that is a modest alternative channel which sits alongside the Research Councils, which are more discipline-based. Since developing the very best talent and attracting the very best talent is very high on our priority list, it seems to me to make eminently good sense to continue to channel money through them towards developing human capital and talent on a modest sort of scale. The same thing for the Royal Academy. The other part of their uniqueness has to do with their ability to pull together multi-disciplinary groups of very good people to respond to questions and look at issues. That is also a very important area.

Chairman

75. The Royal Society of Edinburgh is a similar thing but they have managed to get J K Rowling as a member for example. A second question would be: why can Research Councils not do all these things as well? We are not hearing from anybody what is so special and unique that no-one else can do it?

(*Professor King*) You are raising an issue which is of importance to you, but if we look around the world, take the United States, they have an academy, take France, they have an academy, Germany has several academies. Immediately I say that I can tell you that it is much easier in Britain for us to have a single Academy/Royal Society than in Germany where they have several. When Britain needs to express a voice, for example on climate change, the Royal Society is able very quickly to assemble a group of experts in that area. Nineteen world academies wrote a document on the climate change issue and subsequently President Bush asked the National Academy in America to comment on the climate change issue and their comment eventually was in line with the comments from the other 19 academies. I think that is an invaluable function which is being performed there. I am giving you just one fairly extreme example. The Royal Society or these academies are in a sense not anything like the usual clubs, nor are they like the usual professional societies because the entrance into these is done as a kind of medal awarding process, a lifetime's work in science which is recognised through these letters which go behind your name, FRS. The charge elitist can just as equally be made of the Royal Society as it could of, not your favourite football club but one which is firmly in the Premier Division, say Birmingham. The issue is fairly clear. A Fellow of the Royal Society is not a member of a club that anyone can join. It is a kind of medal which is awarded for achievement in science. That is important. Some of what I read seems to indicate that this is like a private club which keeps people out on some other basis.

76. There is a perception of that in the scientific and academic community. The perception is that because public money is going in we have a right to pose that question.

(*Professor King*) Just let me make this point. In addition to the excellent people who become Fellows of the Royal Society, there is now a second rung of younger people who are the University Research Fellows. These are young people who are getting these fellowships which run for eight or ten years. They go equally through a highly selective process. What this means is that the Royal Society has become rejuvenated because they bring these young people into their fold so when I approach the Royal Society for advice, I do not only engage the older community who have achieved the FRS, but also University Research Fellows. I do think that is a very substantial exercise, a worthwhile exercise that they perform. I would defend it very solidly.

77. Yes, it is quite clear you are doing that. But the GMO debate was quite different. "Instant rebuttal" there meant quite a long time for the Royal Society to instantly rebut what the green groups and others were doing. So there is a charge there that they may have sharpened their act up on climatic research but not on GMOs and we are still living with the damage which was done there across the country to British science. I still ask the question of you: why can the things which are done by the Royal Society, bright young people and so on, not be done with the Research Councils?

(*Dr Taylor*) May I say that most of the Research Councils have some research fellowship schemes of one kind or another? They already do do it. It is not as though we do this through the Royal Society instead of doing it through Research Councils. It is important to understand that the Research Councils have very active post-doctoral fellowships.

78. The question is: why do they not do it all?

(*Dr Taylor*) That is an element of diversity and an element of adisciplinarity. The fact is the Royal Society does not have a flag up about a particular discipline. If you like, it is one of those things which says the trans-discipline, multi-discipline label can, particularly when you are looking at young talent, be very important. I can send you a list of the money which I send to the Royal Society, which flows through to research professors, university professors, fellows.

79. That would be helpful.

(*Dr Taylor*) It almost all goes through to young people and to researchers in fellowship schemes of one kind or another.

80. Could you send that?

(*Dr Taylor*) I should be glad to.

Mr McWalter

81. Multidisciplinarity. One of the things I am particularly interested in is the potential contribution what we might call discursive subjects might make to making science more attractive, whether you are talking about people writing essays about the impact of various sciences and technologies on society, talking about the ethical status of scientific judgement and whether you are talking about the history of science. We are currently looking very carefully at whether that may well have a role in making science a great deal more attractive by putting people into the historical circumstances. I was going to ask you, in connection with all of that, what progress has been made with the review of the Arts and Humanities Research Board where obviously a lot of those subjects come from and have potentially a lot to contribute to the debate. Is that research board to be granted Research Council status? If so would it be funded by the OST or would you need some great new structure in order to accommodate it? Presumably you would wish to accommodate those areas if you could.

(*Dr Taylor*) Presumably you are familiar with the state of the formal investigations. There is a report currently with the Department for Education and Skills to come to Ministerial decisions about what is going to happen here. The Foundation for Science and Technology recently hosted an open meeting in London where I and two or three other people were invited to speak about this issue. We had a very positive debate. The climate is that they want to become a Research Council, they understand what that means and they are comfortable with that. The

[**Mr McWalter** *Cont*]
Research Council community would be keen to have them join, so long as they brought their money with them. That is very clear and understood.

82. They do not have much.

(*Dr Taylor*) They are not as badly off as you might think. We recently issued an invitation from RCUK for the Chief Executive of AHRB to join us round the table as an observer until such time as ministerial decisions emerge about what is going to happen. The debate we had was a very open and positive one. David Eastwood is now sitting with us. We had RCUK meeting today which he attended.

83. So David feels positive as well. I am very pleased to hear that. Do you feel positive about that as well?

(*Dr Taylor*) Absolutely; I feel very positive. I think that the boundaries between different areas of research need to be worked away at. If we take arts and humanities, there are many areas of important overlap with the sciences, engineering and technology. You only have to think of architecture, engineering, design. It can only be advantageous to have a single funding organisation, in other words to move AHRB from its position in DfES into the OST. We might need to think about changing the name of the OST.

Chairman: That was my very next question. I was going to ask you what it would be.

Mr McWalter

84. Office of Innovation.

(*Professor King*) Office of Research, perhaps.

Chairman: John Taylor, David King, thank you very, very much indeed for coming and sharing with us your thoughts on the activities which you are undertaking on behalf of British science. We are very pleased that you have come before the Comprehensive Spending Review because we have great hopes for that too. Thank you very much for all that you are doing. We shall give you a break for a few weeks and see you again probably. I hope that we share our endeavours and secrets and ideas. Thank you very much for offering to give us the documentation. We shall be in touch. David King, John Taylor, thank you very much.

APPENDIX TO THE MINUTES OF EVIDENCE

Memorandum from the Office of Science and Technology

NOTE: REFERENCES TO Q . . . ARE TO QUESTIONS ASKED AT THE ORAL EVIDENCE SESSION ON 15 MAY

THE SPENDING REVIEW PROCESS

1. Please provide a note explaining the Spending Review process and timetable. For example, did each of the Research Councils submit separate bids to OST, or a combined bid? Did the OST submit a bid to DTI, or directly to the Treasury? At what level did negotiations take place? Was OST required to justify all expenditure or only bids for increased expenditure? And what is the process now, after the Spending Review announcements? When will the Science Budget allocations be made?

Answer:

Spending Reviews (SRs) are carried out every two years and set firm budgets for three years, the first year of each SR period being the third year of the previous SR. In the case of the Science Budget and the Dual Support system more generally, the last two SRs have been preceded by Cross-cutting reviews, held with HM Treasury, DfES and others. The Cross-cutting reviews have focused on issues such as the sustainability of the university research base and knowledge transfer from the Science and Engineering Base. The aspect of the SRs which covers the UK science research portfolio managed through the Research Councils has been managed by OST and the Councils as a separate process.

The Cross-cutting review of Science and Research which preceded SR2002 began in July 2001. It was led by Lord Sainsbury and reported to the Chief Secretary to the Treasury at Easter 2002 having taken account of a wide body of evidence accumulated before and during the review. The spending decisions based on the outcome of the review were determined between Easter and summer in a series of discussions with HM Treasury involving Ministers and officials from the relevant spending Departments.

With respect to the science research portfolio, OST invited the Research Councils to submit initial proposals for the SR2002 period in April 2001 and discussed these in detail with the Councils at a series of meetings at Chief Executive and Science and Research Director level over succeeding months. In coming to a view on their own priorities, the Councils sought input from their own research communities. This fact and the fact that the exercise was begun so early in the spending review cycle meant that this round was probably the most transparent and inclusive process that there has been to date.

What was also notable this time was that the Councils worked together on their proposals to a far greater degree than ever before and most of the best proposals that were received by OST were of a multi-Council and cross-disciplinary nature.

The Science Budget is ringfenced within DTI. The Science Budget proposals were submitted to HM Treasury as part of the DTI's Analysis of Resource in February 2002 and were therefore approved by the Secretary of State for Trade and Industry in the same way as all other aspects of the DTI proposals. The Secretary of State was invited to discuss all of her spending proposals at PSX.

This SR took a largely (though not wholly) incremental approach to the level of resources. Ministers took the view that the Science Budget was on the right trajectory, but that the level of resources had not yet reached the desired level.

The Science Budget settlement (2002) provided new money in six areas, as follows:

	Resource			*Capital*		
	2003–04	*2004–05*	*2005–06*	*2003–04*	*2004–05*	*2005–06*
New science	0	116	255	0	20	45
Large facilities				31	87	60
Knowledge Transfer	0	16	30			
Roberts implementation	10	40	100			
University research sustainability—RC indirect cost contribution	0	0	120			
University research sustainability—dedicated capital line				0	50	50

The funds for new science and large facilities (this line includes money for Diamond and for Research Council Institutes) and some of the funds for Roberts implementation (increased PhD stipends and funding for improved PhD and postdoctoral training) will be allocated to Councils during the autumn and the outcome will be published by means of a written answer in mid-November, as usual. In this exercise, DGRC will advise the Secretary of State on the allocations she should make having himself been advised by the RCUK Strategy Group which will have met on three occasions expressly to consider this matter.

Knowledge Transfer funds will be distributed in a separate exercise, which will take place over the next year, and will involve universities bidding for funding from the new HEIF scheme.

The funding for the new dedicated capital line for university research infrastructure (which will amount to £500 million per year from 2004–05, including £300 million from the Science Budget and £200 million from DfES) will be allocated by formula in a similar manner to that used for SRIF. We expect the allocations to be announced very early in the New Year.

Following publication of Investing in Innovation, the Government will shortly begin a programme of work, to be led by Lord Sainsbury, to ensure that the measures set out in that publication are implemented. The programme of work will include consideration of the most effective way to use the £120 million per year allocated to the Science Budget for increasing the Research Councils' contributions to universities research costs, in the light of the Dual Support System and the evidence from the Cross-cutting review. This work will also be used to determine the most effective means of disbursing the remaining money for Roberts implementation (for increasing post-doctoral salaries and for establishing 200 new academic fellowships per year).

THE CROSS-CUTTING REVIEW

2. (Q6) A three page resume of the cross-cutting review of science and research is published in chapter 25 of the Spending Review White Paper (Cm 5570). Has the full review been published? If not, why not? May the Committee have a copy?

Answer:

The Cross-Cutting Review of Science and Research was not originally envisaged as a document for publication—it was carried out to inform the development of the Government's science strategy. Most of the output from the Cross-Cutting Review was picked up in some detail in the Government's science strategy, Investing in Innovation, which was published on 23 July 2002. At your request, the Cross-Cutting Review will be published shortly and will be accessible via the HMT's web site: http://www.hm-treasury.gsi.gov.uk/psd/sr2002/ . Hard copies will be sent to the Committee and to the Parliament libraries.

THE TRANSPARENCY REVIEW

3. Similarly, has the Transparency Review been published? If not, why not? May the Committee have a copy?

Answer:

The transparency review was initiated following discussions with, and analysis of the higher education sector which brought to light within Government that if substantial new funds were to be made available to universities for research, universities needed to improve their ability to account for how taxpayer's money was being used. It reflected the view that much of the sector did not have a clear idea of its true cost base.

The review has never produced a final report as such and nor was it ever intended that it should. Instead, the steering group for the review (chaired by DGRC and reporting in turn to the Science and Engineering Base Co-ordinating Committee, chaired by the Government's Chief Scientific Adviser) accepted the recommendation of the Joint Costing and Pricing Steering Group (a HE sector group sponsored by HEFCE and UUK) that universities should adopt a simple but robust costing tool called TRAC (Transparent Approach to Costing). To the HE sector's great credit, TRAC was rolled out across the whole sector ahead of schedule. It allows each institution to put a figure to the total costs of research (publicly and non-publicly funded), teaching (ditto) and other activities (for example knowledge transfer) that it carries out each year. These figures are now reported annually to the Funding Councils who aggregate them up and publish them.

The first and second sets of complete TRAC (published in July 2001 and January 2002) were important pieces of evidence for the Cross-cutting review of Science and Research (qv—section A). The work of the Transparency Review was subsumed therefore within the Cross-cutting review and reflected in the outcome of the spending review. One of the conclusions of the Cross-cutting review was that TRAC was an excellent start but that more now needed to be done to embed proper costing and pricing methodologies across the sector. This is one of the issues that will be covered in the work to implement the measures in Investing in Innovation described in the answer to question 1.

FRAMEWORK 6

4. The CSA offered to provide figures for the seven priority areas in the Framework 6 budget (Q19) and mentioned information given to universities on getting best benefit from this (Q13). It would be helpful to have both of these, together with a note updating the Committee on any developments on Framework 6 and the European Research Area.

Answer:

(i) The Council and Parliament formally adopted the main FP6 programme on 3 June 2002, meeting the target date set at the Barcelona Summit in March. The Rules of Participation, also co-decided by the Council and Parliament, are expected to be formally agreed in September. The UK secured its main priorities for the programme, including: i) focus on a limited number of key thematic priorities; ii) a substantial increase in funding schemes to promote the trans-national mobility of researchers; iii) the introduction of new funding instruments (Integrated projects and Networks of Excellence) as the main vehicles for maximising the overall impact of European collaborative research; and iv) a commitment to more efficient management of the programme by the Commission.

(ii) The budgets requested for the seven thematic priorities can be found at Annex C—at the end of this document.

(iii) The negotiations on implementing the Specific Programmes (SPs) have progressed relatively smoothly. The Danish Presidency hope to secure formal Council adoption of the SPs by the end of September. This will depend on agreement on the single outstanding issue, namely the provisions which will apply to the funding of research on human embryos and human embryonic stem cells.

Developments with the European Research Area (ERA)

(iv) In addition to focussing European efforts on a limited number of strategic priorities, FP6 will also aim to network national research activities, share best practice on engaging science with society, support the planning of research infrastructure etc. Funding for such activities is set out in the attached budget at Annex C.

(v) Other examples of ERA-related work include the benchmarking of Member States' research and development (R&D) policies and the pilot mapping of European excellence in specific fields. Also, the Barcelona Summit in March called for spending on R&D and innovation in the EU to reach 3 per cent of GDP by 2010, with two thirds coming from the private sector.

Information Given Out to Universities on Getting the Best Benefit from FP6

(vi) On 22 January 2002, OST hosted a major conference to help the UK research community prepare for participation in FP6. This high profile event provided over 500 delegates with information on the new funding instruments and generated interest among them in finding project partners in Europe. UK Universities were strongly represented at the conference.

(vii) The UK will have a network of National Contact Points in place for the launch of FP6. These will offer advice to potential participants, including universities.

(viii) OST also works closely with the United Kingdom Research Office (UKRO), located in Brussels, which provides advice to the UK research community, especially universities, on participation in Framework Programmes.

(ix) UK Research Councils are also actively promoting FP6 to their respective communities.

(x) The Commission will hold a major FP6 launch event in Brussels on 11–13 November.

INFRASTRUCTURE FUNDING

5. (Q39) Where are lists of JIF grant recipients published?

Answer:

Lists of JIF award recipients were published in press notices after each of the five rounds of awards. There is no single list covering all the awards across the five rounds. OST will be placing a full list of awards on its website next month. We will send a copy to the Science & Technology Committee at the same time we post the list at: http://www.ost.gov.uk/

OBJECTIVES/TARGETS

6. (Q57ff) The Public Service Agreements 2003–06 were published with the Spending Review (in Cm 5571). Will this be followed by publication of a Service Delivery Agreement (SDA)? If so, when and in what form? (The last SDA was published with the DTI Annual Report 2001. Will the new SDA be published sooner than next April/May?)

Answer:

The Department's first SDA was published in November 2000 on its website and subsequently reproduced in the 2001Annual Report. It is currently planned to publish the new SDA on the DTI website by the end of October 2002. The new SDA will provide information on how the Department is intending to deliver its PSA targets, including those related to the Office of Science and Technology.

7. Does the OST have more detailed performance targets than those set out in the PSA and SDA? If so, can the Committee have a copy? Will these change in the light of the new PSA?

Answer:

The PSA target on science and the associated SDA targets form the basis on which the performance of the Science and Engineering Base Group within OST is measured. Those targets are cascaded down to all staff through the DTI's annual appraisal and business planning cycle.

8. Please explain when, and in what form, the OST will be publishing output and performance data.

Answer:

OST will be providing annual reports on the relative international performance of the Science and Engineering Base (SEB) for the new PSA target number 2. The form of the report is undecided at present, but is likely to involve a suite of indicators covering people, publications and patents.

OST is reviewing the whole issue of strategic and performance management of the activities supported by the Science Budget (see next answer) and we expect to have something to say about this later this year.

9. Please explain the process by which objectives and targets are set for the OST's associated public bodies. It would be helpful to see these targets, or examples of these targets.

Answer:

Following the recommendations of the recent quinquennial reviews of the Research Councils, OST is currently reviewing the performance management framework between itself and the Research Councils (and other associated bodies). In undertaking this work OST is taking into account recent guidance from the Cabinet Office and Treasury concerning effective objective setting for NDPBs and Agencies.

In the current system there are two main processes relating to objective setting:

(i) Alongside spending review allocations. At the time of allocations to the bodies from spending reviews a small number of objectives are set for expenditure of the new money allocated (above existing baseline funding). These objectives are included in the associated allocations booklet (see, for example, Science Budget 2001–02 to 2003–04).

(ii) As part of the annual planning and reporting cycle. Research Councils include in their annual Operating Plans more detailed objectives and targets relating to their expenditure plans. Typical targets in these areas are concerned with the timing, number and funding of investments in particular research programmes, training activities or other sponsored schemes. Operating Plans also cover efficiency and effectiveness of Research Council run operations and include targets for areas of performance such as service delivery and administration cost caps. Typical targets here are related to the turn round times for and costs of administering grants. All Research Councils also have a target linked directly to OST's SDA target limiting the proportion of the grant in aid they administer that can be spent on operating costs (currently set at a maximum of 4 per cent).

Annual Operating Reports report the performance of Research Councils in meeting these objectives and targets. They also include a report against a standard set of output performance indicators (OPIs) in the four key objective areas of Research, Training, Industrial Competitiveness and Quality of Life, and Promotion of Science. Consideration of the existing set of OPIs is also part of the review of the performance management framework.

DTI Innovation Group

10. (Q58) What progress has been made with appointing a new Director General of the Innovation Group?

Answer:

The new Director General Innovation is David Hughes who takes up post on 3 October. Mr Hughes worked for BAe Systems as a Special Projects Director. The Innovation Group will have responsibility for the development and implementation of innovation policy, particularly in manufacturing.

Skills Base

11. (Qq 61–63) Mr McWalter asked for evidence that the OST had demonstrated concern about the skills base prior to the Roberts Review.

Answer:

The OST was responsible for implementing the postgraduate training, research career, and women-in-science policies in the 1993 White Paper "Realising Our Potential". Generally, OST has worked with and through the Research Councils and learned societies to implement and develop policy. It implemented the 1993 White Paper "MRes" proposals, advised on increases in the number of Royal Society University Research Fellows and level of Research Training Support Grant paid to Research Council PhDs. It encouraged and contributed funding to a 1997 Research Council career path survey of former postgraduates. It worked directly with the University of Sheffield to pilot a web-based survey of postgraduate study intentions for three years from 1999. As the Roberts' report notes, this shed light on the attitude of undergraduates to postgraduate study and appropriate stipend levels. The OST brokered the Research Careers Concordat between the funding agencies and university representative bodies in the mid 1990s, and went on to play a lead part alongside Universities UK in the Research Careers Initiative. In addition, the White Paper 'Excellence and Opportunity' (July 2000) recognized that there needed to be better pay levels for post-graduates.

The Promoting SET for Women unit has been part of OST since 1995, and was set up to tackle women's under-representation in the science, engineering and technology (SET) community. The unit's aim is to improve the recruitment, retention and progression of women throughout SET education and employment and to increase their involvement in shaping SET policy.

SPIN-OUT

12. (Qq 65–67) It would be helpful to have figures on business start-ups from universities and their survival rates.

Answer:

The first survey of Higher Education Business Interaction carried out in 2001 showed that 199 companies were spun out from universities in the academic year 1999–2000, compared to an average of 70 each year for the previous five years. The Survey also showed that in 1999–2000, UK universities identified one spinout for every £8.6 million of research expenditure, compared with one spinout for every £13.9 million in Canadian Universities in 1999, and one spinout for every £53.1 million in the US. As regards survival rates, the survey also covered employment, turnover and equity value of spinouts established by universities but responses were incomplete and raised concerns about the burden associated with collecting this data. A modified second survey currently underway seeks to build on data previously collected to provide a more systematic overview of exploitation performance across the higher education sector.

ROYAL SOCIETY SPENDING

13. (Qq 78–80) The DGRC offered to send details of the grant-in-aid to the Royal Society. It might be most helpful simply to update, with figures for 2002–03, the table provided in January 2002 (as printed in HC 459-1, Ev25-26). For completeness, it would be helpful to have a similar update for the Royal Academy of Engineering.

Answer:

See updated tables for:

Royal Society at Annex A

Royal Academy for Engineering at Annex B

AHRB

14. (Qq 81–83) Following the publication of the Review of Arts and Humanities Funding, what is the timetable for decision-making on the future of the AHRB? Would a change in the status of the AHRB require primary legislation? If so, when might this be introduced?

Answer:

The Government is consulting the Devolved Administrations on the future of the AHRB and hopes to be able to announce a decision later this year. As set out in the report of the Review of Arts and Humanities Research Funding, it would require primary legislation to fully implement the report's recommendations. This would be bound to take some time to enact given the pressures on legislative time.

CCLRC

15. The Committee has noted the publication of the quinquennial review of the CCLRC. What difference will this make to the management of large resources? What is the significance of the change to funding directly from OST?

Answer:

Once implemented, the new arrangements contained in the QQR report and the new strategic ownership model, in which CCLRC's membership of Research Councils UK allows full stakeholder involvement in the strategic management of CCLRC, will contribute significantly to delivering a more strategic approach to the investment, management and operation of a major element of the UK's scientific infrastructure.

Previously Science Budget funding of CCLRC was effected via service level agreements between CCLRC and the individual Research Councils renegotiated on an annual basis. The new arrangements mean that CCLRC will receive direct funding from the Office of Science and Technology for providing, operating, maintaining developing and upgrading its large facilities and their instrumentation on the basis of the medium term plans agreed by Research Councils UK. This will ensure that the CE of CCLRC as Accounting Officer is clearly and visibly accountable for the value for money of the delivery of all aspects of access, operation and development of these national facilities.

DIAMOND

16. Please provide a note updating the Committee on the progress of the Diamond synchrotron project and the compensation package for the North West.

Answer:

The measures taken to underpin the science base in the North West have produced good results. The projects awarded funding by the North West Science Review are making steady progress under the supervision of the Research Councils and the North West Science Council. Management boards have been set up and many have succeeded in attracting further additional funding from other sources and the recruitment of key staff has been completed. One of the centers is due to open in spring 2003.

The North West Science Council has been working on putting together a 10–15 year strategy for science and technology in the North West, setting up working parties to investigate different areas of science within the region. The working parties have reported back to the Council and a draft strategy has been sent out for consultation.

On the Diamond project a number of key appointments such as the Chief Executive Officer, Science, Technical Directors and Head of Finance have been made. The Joint Venture Company, Diamond Light Source was launched in March 2002. Since then the project has passed Gate 2, the procurement phase, of the Office of Government Commerce Gateway Process. The team are now preparing for Gate 3, the building phase.

Much work has taken place on fine-tuning the design and technical aspects; a tender is being issued for the building work. In addition Diamond Light Source are working on developing links with other organisations, a collaboration agreement has been signed with the European Synchrotron Radiation Facility (ESRF) in France. It is hoped that more such agreements will be signed in the near future.

CAMBRIDGE/MASSACHUSETTS INSTITUTE OF TECHNOLOGY (CMI)

17. Please provide a note explaining the rationale for OST expenditure on the Institute, the purpose to which it is being put, and how it is being evaluated.

Answer:

Rationale for OST expenditure on the Institute: The CMI strategic alliance was announced by the Chancellor, who agreed to make funding available for CMI to undertake joint educational and research initiatives. As CMI is an experiment in creating a new model for global higher education, which will help define the research university of the 21st century, funding is allocated via OST.

The purpose to which it is being put: CMI's mission is to provide a catalyst to improve economic competitiveness and productivity whilst working with UK universities to encourage the entrepreneurial spirit in higher education. CMI will achieve this through funding and support for four key programmes: Integrated Research; Undergraduate Student Education; Professional Practice Programmes and National Competitiveness Network.

How it is being evaluated: Ongoing evaluation is being undertaken by CMI, which is a limited company with a private sector led Board, and an Advisory Board with members from US and UK academe and industry.

CMI are commissioning external consultants to assist them and are also being advised by DTI Performance and Evaluation Unit. OST will be commissioning an independent evaluation.

ESTIMATES

18. It would be helpful to have a brief guide to the annual Estimates and accounting process, explaining the various documents now produced, their timing and significance. (For example, what is the difference in purpose between the Main Supply Estimates and the Supplementary Budgetary Information?)

Answer:

Parliament approves expenditure on an annual basis. The mechanism for doing this is that the Treasury presents main Supply Estimates in the Spring of each year. Each department has a separate Estimate within the total volume. Parliament gives legislative approval. There can also be Supplementary Estimates, normally presented in the Summer, Winter and Spring, with similar approval mechanisms.

The underlying process for the main Estimate is that during the Winter, the Treasury asks each department to submit information, to link the plans agreed in the Spending Review relating to that Estimate year (subject to any subsequent agreed changes) to the Estimate for the Science Budget (Request for Resources 2, RfR2), and Functions. Supplementary Estimates mainly record drawdown of underspends from previous years, and agreed inter-Departmental transfers of responsibility for Voted budgets.

The detailed lines in "Part II subhead detail" result from technical classifications within resource budgeting.

To date, each department has published supporting information in its Annual Report, for example DTI in "The Government's Expenditure Plans 2002–03 to 2003–04", the departmental report. Following a review of departmental reports, published in October 2001, it was agreed that the tabulated information in such reports should be reduced and that the more technical tables for all departments should be published in a Supplementary Budgetary Information volume.

The Main Estimates, Expenditure Plans Report and Supplementary Budgetary Information are published simultaneously and there is full read-across between the documents.

Departments are required under legislation to prepare annual Resource Accounts to set out their actual expenditure against the Estimates approved by Parliament, and these are audited by the National Audit Office. The target is to lay the resulting Accounts before the House with the C&AG's certificate, during the Autumn of each year.

19. What, in the OST's view, is the purpose of the Departmental Annual Report? Has OST considered publishing an annual report of its own?

Answer:

The Expenditure Plans Report for Trade and Industry, published by DTI is one of a series of reports which are published by Government annually in which Departments set out their expenditure plans for the future as well as setting out key achievements in the past year. These reports are a valuable document of record and an important part of the mechanism through which Departments may be held accountable to Parliament for their stewardship and effective use of taxpayers money. OST is not a Department in its own right and does not therefore publish its own annual report.

20. Please explain why (a) the Swindon Research Councils Pension Scheme and (b) Nuclear Fusion are identified as separate items in the Estimates.

Answer:

(a) Six of the Research Councils participate in the Research Councils Pension Scheme (RCPS), which is closely analogous to the civil service scheme. For mainly historical reasons, the Medical Research Council has a separate and funded pension scheme. The RCPS incorporates separate schemes previously run by each Council. While the RCPS is managed on behalf of the Councils by BBSRC, given its cross-Council nature and the need for transparency and accountability, the scheme is shown as a separate line in Estimates.

(b) It was agreed within the department during 2001–02 that responsibility for Nuclear Fusion would transfer from the DTI's Nuclear Industries Directorate (shown in the Estimates RfR1) to the OST (Estimates RfR2), with EPSRC responsible for overall programme management. For timing reasons the budget for nuclear fusion could not be transferred to EPSRC for 2002–03 and so was retained as a discrete line within OST. From 2003–04, the funding for nuclear fusion research will be part of the grant-in-aid for EPSRC.

21. With reference to the Supplementary Budgetary Information 2002–03 (pages 145-146), please explain the apparent fall in the administration costs of (a) the Science and Engineering Base Group from £136,000 in 1999–2000 to £14,000 in 2001–02 and (b) the Transdepartmental Science and Technology Group from £276,000 in 1999–2000 to £36,000 in 2001–02. How do these figures relate to those on page 213 of the Main Estimates 2002–03?

Answer:

These figures refer to the net capital element of SEB and TDST Administration costs, shown in the Supplementary Budgetary Information volume. For SEB, £14,000 is the net capital cost for 2002–03 after allowing for non-operating appropriations-in-aid (similarly £36,000 for TDST). These net figures can be compared with the net figures above for previous years. One reason for the reductions is that the department outsourced the provision of IT equipment and this is now paid for from resource.

September 2002

Annex A

Table 1

ROYAL SOCIETY FUNDING AS SET OUT IN THE SCIENCE BUDGET 2001–02 TO 2003–04

£ million	*2001–02*	*2002–03*	*2003–04*
Total	26,065	28,783	29,285

Table 2

THE ROYAL SOCIETY: GOVERNMENT-FUNDED BUDGET 2001–02 & 2002–03 & 2003–04

Programme	*Grant-in-aid 2001–02 £000*	*Grant-in-aid 2002–03 £000*	*Grant-in-aid 2003–04 £000*
Research Professors	781	774	808
University Research Fellowships	9,939	10,538	10,664
Dorothy Hodgkin Research Fellowships	825	865	900
Industry Fellowships	200	200	200
Research Grants	5,872	5,872	5,872
Merit Awards	200	2000	2000
International Fellowships and projects—developed world	2,012	2,553	2,793
International Fellowships and projects—developing world	1,325	1,325	1,325
International Conferences and grants	1,030	1,030	1,030
Relationships with international bodies	699	699	699
Science Communication and Education	888	888	888
Scientific Advice	100	100	100
Rosalind Franklin Awards		13	40
Rent	306	306	306
Administration	1,538	1,595	1,660
External redecoration	250		
IDIL Study	100	25	
Total	26,065	28,783	29,285

Table 3

GRANTS AND SCHEMES SUPPORTED BY THE ROYAL SOCIETY'S GRANT-IN-AID 2002–03
(Figures in italics are estimates)

Award	*Grant-in-aid funding £000*	*No.*	*Private funding £000*	*No.*
University Research Fellowships (URF)	10,538	*310*	330	*10*
Dorothy Hodgkin Fellowships	865	*42*	650	*17*
Industry Fellowships	200	*12*	300	*17*
Wolfson Foundation/OST Merit Awards	2,000	*17*	2,000	*17*
Research Professorships	774	*12*	390	*5*
Conference Grants	850	*360*	—	—
Research Grants	1,850	*1,980*	—	—

Table 4

GRANTS AND SCHEMES SUPPORTED BY THE ROYAL SOCIETY'S PRIVATE FUNDING 2002–03

Award	*Funding £000*	*Features*
Wolfson Refurbishment Grants	2,475	Funding for universities to refurbish research laboratories
Brian Mercer Innovation Awards	250	Seed corn funding to aid the commercialisation of scientific discoveries
Leverhulme Trust Senior Research Fellowships	245	Funding to aid established academics to concentrate on full-time research for a period of time

Annex B

Table 6

THE ROYAL ACADEMY OF ENGINEERING'S DIRECT INCOME 2002–03

Source	*Funding £000*	*Percentage of income*
Grant-in-aid	4,770	35.5
Gatsby Charitable Foundation	1,161	8.6
Income from investments	381	2.8
Events and facilities hire	209	1.6
Donations and direct sponsorship	80	0.6
Subscriptions	121	0.9
Other	377	2.8
Total	7,099	52.8

Table 7

THE ROYAL ACADEMY OF ENGINEERING'S THIRD PARTY INCOME IN SUPPORT OF PROGRAMMES 2002–03

Purpose	*Funding £000*	*Percentage of income*
Grant-in-aid funded programmes	3,768	28.0
Gatsby funded programmes	2,393	17.8
Other programmes	192	1.4
Total	6,353	47.2

Table 8

ALLOCATIONS IN THE ROYAL ACADEMY OF ENGINEERING'S GRANT-IN-AID 2002–03

Programme	*Allocation £000*
Personal Research Chairs and Senior Research Fellowships	629
Postdoctoral Research Fellowships	519
Engineering Professional Development Awards	230
International Travel Awards	430
Visiting Professorships in Design and Sustainable Development	500
Industrial Secondments	306
Engineering Foresight Awards	410
Engineering investigations	492
Education studies and support	394
Public communication and overseas representation	860
Total	4,770

Table 9

GRANTS AND SCHEMES SUPPORTED BY THE ROYAL ACADEMY OF ENGINEERING'S GRANT-IN-AID 2002–03

Award	*Funding £000*	*No.*
Personal Research Chairs	629	11
Senior Research Fellowships	Inc above	5
Post-doctoral fellowships	519	9
Industrial secondment	306	24
Engineering Foresight Awards	410	15

Annex C

SIXTH FRAMEWORK PROGRAMME 2002–06

	Types of Activity	*Millions of Euros*			*%*
1	*FOCUSSING AND INTEGRATING COMMUNITY RESEARCH*	13,345			76.3
	THEMATIC PRIORITIES[1]		11,285		64.5
	LIFE SCIENCES, GENOMICS AND BIOTECHNOLOGY FOR HEALTH		2,255		12.9
	— Advanced genomics and its applications for health			1,100	6.3
	— Combating major diseases[2]			1,155	6.6
	INFORMATION SOCIETY TECHNOLOGIES[3]		3,625		20.7
	NANOTECHNOLOGIES AND NANOSCIENCES, KNOWLEDGE-BASED MULTIFUNCTIONAL MATERIALS AND NEW PRODUCTION PROCESSES AND DEVICES		1,300		7.4
	AERONAUTICS AND SPACE		1,075		6.1
	FOOD QUALITY AND SAFETY		685		3.9
	SUSTAINABLE DEVELOPMENT, GLOBAL CHANGE AND ECOSYSTEMS		2,120		12.1
	— Sustainable energy systems			810	4.6
	— Sustainable surface transport			610	3.5
	— Global change and ecosystems			700	4.0
	CITIZENS AND GOVERNANCE IN A KNOWLEDGE-BASED SOCIETY		225		1.3
	Specific activities covering a wider field of research		1,300		7.4
	— Supporting policies and anticipating scientific and technological needs		555		3.2
	— Horizontal research activities involving SMEs		430		2.5
	— Specific measures in support of international co-operation[4]		315		1.8
	Non-nuclear activities of the Joint Research Centre		760		4.3
2	*STRUCTURING THE EUROPEAN RESEARCH AREA*	2,605			14.9
	Research and innovation		290		1.7
	Human resources and mobility		1,580		9.0
	Research infrastructures[5]		655		3.7
	Science and society		80		0.5
3	*STRENGTHENING THE FOUNDATIONS OF THE EUROPEAN RESEARCH AREA*	320			1.8
	Support for the co-ordination of activities		270		1.5
	Support for the coherent development of policies		50		0.3

Types of Activity	*Millions of Euros*			*%*
4 *RESEARCH AND TRAINING IN THE NUCLEAR FIELD (EURATOM TREATY)*	1,230			7.0
Priority thematic fields of research		890		5.0
— Controlled thermonuclear fusion			750	4.3
— Management of radioactive waste			90	0.5
— Radioprotection			50	0.3
Other activities in the field of technologies and nuclear safety		50		0.3
Activities of the Joint Research Centre		290		1.7
TOTAL	17,500			100

[1] Of which at least 15 per cent aimed for SMEs.

[2] Including up to EUR 400 million for cancer-related research.

[3] Including up to 100 million for the continued development of Géant and GRID.

[4] This amount of EUR 315 million will fund specific measures in support of international cooperation involving developing countries, Mediterranean countries including the Western Balkans, and Russia and the Newly Independent States (NIS). Another EUR 285 million is earmarked to finance the participation of third country organisations in the 'Thematic Priorities' and in the 'Specific activities covering a wider field of research', thus bringing the total amount devoted to international cooperation to EUR 600 million. Additional resources will be available under section 2.2 'Human resources and mobility' to fund research training for third country researchers in Europe.

[5] Including up to EUR 200 million for continuation of the Géant and GRID projects.

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