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Science and Technology
Committee

**Office of Science and
Technology: Scrutiny
Report 2004**

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written evidence*

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The 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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Summary

The scrutiny of the Office of Science and Technology (OST) is one of our core functions. This Report is our assessment of its activities in 2004.

The Government's *Science and Innovation Investment Strategy 2004–2014* and the Spending Review that accompanied it are welcome news for the UK scientific community. These developments give science the emphasis that it deserves on the political agenda. Nonetheless we recommend that the Government ensures that the ambitious targets that it has signed up to as part of the Investment Framework are genuinely attainable. In particular we urge the Government to lead by example by increasing the volume of R&D that it carries out within its own departments.

We note that OST has taken several positive steps to address many of the issues raised in our 2003 Report on its work. It is difficult to assess the UK's performance in science and engineering because many of the indicators used for this purpose are still relatively new, and the benefits of increased investment are often only seen in the longer-term. We remind the Government of the importance of continuing to increase its investment in science, even when the results do not become apparent immediately. We also recommend that the Government continues to employ the very useful set of indicators established by Evidence Ltd.

The Government has made a commitment to ensuring the sustainability of the Research Base by increasing the amount that the Research Councils contribute towards the full economic cost of each research project. We commend the Government for this step, although we note that the implementation of this new policy will consume the majority of the extra funding allocated to the Research Councils in Spending Review 2004. We urge the Government to ensure that the total volume of research supported by the Research Councils does not decrease in the drive towards meeting the full economic cost of that research.

1 Introduction

1. 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 (OST) and its associated public bodies.¹ These “associated public bodies” are not clearly defined: we have taken the term principally to mean the seven Research Councils and the Council for Science and Technology.

2. OST has been part of the Department of Trade and Industry (DTI) since 1995. It has two primary functions:

- **The Transdepartmental Science and Technology Group** supports the Chief Scientific Adviser (CSA), the head of OST. The CSA acts as adviser to the Prime Minister, the Cabinet, the Secretary of State for Trade and Industry and the Minister for Science and Innovation, on science, engineering and technology matters.
- **The Science and Engineering Base Group** supports the Director General of the Research Councils (DGRC) in allocating the Science Budget and in assuring the successful operation of the seven Research Councils.

OST’s role in overseeing science and technology policy across Government is mirrored by the broad remit of the Committee, which frequently scrutinises the work of other Government departments in the area of science policy.

3. Each year we produce a Report on the work of OST. In support of this we aim to hold an evidence session with the Secretary of State for Trade and Industry during the course of each parliamentary session: this year Patricia Hewitt appeared before us on 14 July. In last year’s Report we announced that we would be holding regular “Science Question Time” sessions with the Minister for Science and Innovation, Lord Sainsbury of Turville.² It has been a longstanding regret of ours that the Minister’s membership of the House of Lords denies Members the opportunities enjoyed by members of other select committees to question Ministers during debates and departmental question times. We were therefore very pleased that the Science Minister agreed to our suggestion of regular brief sessions to discuss science policy issues. This year we held four such sessions on 9 February, 12 May, 14 July and 1 December. As well as raising issues of concern to the Committee, we solicited topics for questioning from the public and raised issues of national interest. The format has enabled us to be more reactive to topical issues than has been possible in the past and has helped to improve the quality of our scrutiny of OST.

4. Evidence sessions held with Ministers from other departments have also been used to inform this Report. In July the Government published its *Science and Innovation Investment Framework 2004–2014*. The document heralded a substantial increase in the Science Budget and demonstrated the increasing importance of science within the broader political agenda. On 1 November we held an evidence session with a Minister from each of the three departments responsible for producing the document: Rt Hon Paul Boateng,

1 House of Commons Standing Order No. 152

2 Fourth Report of the Committee, Session 2003–04, *The Office of Science and Technology: Scrutiny Report 2003*, HC 316, p 30

Chief Secretary to the Treasury; Dr Kim Howells, Minister of State in the Department for Education and Skills; and the Lord Sainsbury of Turville, Parliamentary Under-Secretary of State, Department of Trade and Industry. The transcript of this session, and those of all the sessions referred to in paragraph 3, above, are published alongside this Report.

5. In addition to taking oral evidence, we also submitted a number of written questions to OST. We are grateful to OST for providing the considered responses that are published with this Report. We are grateful to the Scrutiny Unit in the House of Commons for providing us with an analysis of the performance indicators used by OST; and to our specialist adviser, Professor Michael Elves, formerly the Director of the Office of Scientific and Educational Affairs at Glaxo Wellcome plc.

2 Objectives and performance measures

Table 1: Objectives for the Office of Science and Technology for 2003–04 to 2005–06

Key area	Objective
Research	<p>RO1: To continue to improve the excellence, relevance and impact of the knowledge created from Research Council-funded programmes.</p> <p>RO2: To increase research capability and international competitiveness of the UK in new strategic areas.</p> <p>RO3: To increase the dynamism and flexibility of Research Council programmes to respond to changing requirements and opportunities, and to support effectively multi-disciplinary research, new researchers and higher risk research proposals.</p> <p>RO4: To maintain access for scientists working in the UK to the necessary major facilities, databases and supporting laboratory infrastructure that will enable them to deliver world-class research.</p>
Training	<p>TO1: To raise the standard of postgraduate and postdoctoral researchers, and increase their numbers in priority fields experiencing shortfalls or recruitment difficulties.</p> <p>TO2: To enhance their training to better fit them for careers requiring research skills and experience and increase their attractiveness to future employers.</p>
Knowledge transfer	<p>KTO1: To increase the performance of the science and engineering base in exploiting the results of its research.</p> <p>KTO2: To increase the effectiveness of knowledge transfer from Research Council institutes in line with the recommendations of the Baker review of public sector research establishments and the NAO Report on commercialisation of public sector science.</p>
Science in society	<p>SSO1: To enhance public awareness of the outcomes from and priorities for publicly funded science and increase openness over its management and use through greater engagement and dialogue with the public.</p> <p>SSO2: To increase the reach and impact of activities undertaken by the Research Councils and other bodies funded through the Science Budget by improving joint working between them and other organisations.</p>
Operational	<p>OO1: To complete work on implementation of the recommendations of the 2001 Quinquennial Reviews.</p> <p>OO2: To meet the Government's requirements and targets concerning the freedom of information, e-business (including electronic records management), the modernisation of public services and the promotion of racial and gender equality of opportunity.</p> <p>OO3: To have established the systems to support a co-ordinated performance management system for the Science Budget and the Research Councils in time for the next Spending Review.</p>

Source: Department of Trade and Industry, Science Budget 2003–04, 2005–06, December 2002

6. The Office of Science and Technology (OST) is not a Government department in its own right and thus has no headline Public Service Agreement (PSA) targets of its own. Nonetheless, one of DTI's PSA targets, widened in scope as part of Spending Review 2004, clearly relates to the work carried out by OST:

PSA target 2: “To improve the relative international performance of the UK research base, the overall innovation performance of the UK economy, making continued progress to 2008, including through effective knowledge transfer amongst universities, research institutions and business”.³

PSA target 2 is designed to meet DTI’s “Objective II”: “promoting world class science and innovation”.⁴

7. The Science Budget for 2003–04 to 2005–06 contains an additional set of objectives, outlining the areas in which investment from the Science Budget can feed directly into wider Government strategy for science and innovation.⁵ These are given in Table 1, along with OST’s operational objectives.

The Evidence Ltd Reports

8. In 2002 DTI commissioned the consultants Evidence Ltd to develop a wide-ranging set of indicators to benchmark the UK’s performance in science and engineering against that of a comparator group of 25 countries, including all the countries in the G8. Evidence Ltd’s first report was published in October 2003.⁶ Using its findings, DTI was subsequently able to report that the UK was “on course” to meet its targets. A more conclusive statement was not considered possible because “it will take some years before the significant increase in the Science Budget begins to be reflected in a change in the UK’s performance”.⁷ Following our evidence session with Ministers on 1 November this year, we asked when a discernable change in the UK’s performance could be expected. In response, we were informed that “the outputs of research are often not realised until 3 to 6 years after the start of funding and the innovation process may take approximately eight years on average”.⁸ This long lag time makes it difficult to draw any firm conclusions yet about the outcomes of the Government’s increased investment in science and innovation.

9. Following publication of the second Evidence Ltd report, in October 2004, the DTI again reported that the UK is “on course” to meet its targets, although this statement is fairly meaningless given the time lag detailed above.⁹ In its *Autumn Performance Report 2004*, it reports that the UK has an 11.9% share of world citations; is second in six out of the nine broad scientific disciplines; has 5.8 researchers per 1,000 members of the workforce; and leads the G8 for citations per unit of expenditure on publicly performed R&D, citations relative to GDP, and citations per researcher.¹⁰ Given that there are very few changes in the data between 2003 and 2004, few firm conclusions can be drawn, particularly because several of the indicators are subject to year-on-year movements for external reasons, such as changes in GDP. However, the fact that little has changed since the October 2003 report

3 HM Treasury, *2004 Spending Review: Public Service Agreements 2005–08*, Cm 6237, July 2004, p 31.

4 As above

5 DTI, *Science Budget 2003–04 to 2005–06* (December 2002), p 9

6 DTI, *PSA target metrics for the UK Research Base* (October 2003)

7 DTI, *Autumn Performance Report 2003*, Cm 6067, December 2003, para 3.4

8 Ev 54

9 DTI, *PSA target metrics for the UK Research Base* (October 2004)

10 DTI, *Autumn Performance Report 2004*, Cm 6442, December 2004, p 8

itself supports the Committee's argument, made in its 2003 Scrutiny Report, that a biannual, rather than an annual, study might be sufficient.¹¹

10. One of the most noticeable changes charted in the two Evidence Ltd reports is a decline in the UK's share of global publications. When we asked Ministers to comment on this on 1 November, Lord Sainsbury told us that "people tend to not appreciate that with more and more countries becoming developed [...] the likelihood is that in terms of the amount of science, it is likely to be a declining amount simply because more and more countries are becoming wealthy".¹² However, the rise of less industrialised nations such as China and India does not explain why the UK has fallen behind Japan. In answers to further written questions, the Government told us that this could be largely explained by the "steady decline in government funding of R&D as a percentage of GDP that took place throughout the 1990s in the UK [...] while Japan maintained relatively consistent levels of investment and overtook the UK in the late 1990s".¹³ **Performance indicators inevitably tell us as much about past decisions as they do about the current situation. We hope that the areas in which the UK's performance is now suffering due to previous underinvestment will remind the Government of the importance of continuing to increase its investment in science, even when improvements are unlikely be seen in the short term. This is key to ensuring that the UK does not slip further against the performance of other countries in future years.**

11. In our Scrutiny Report 2003 we expressed concern that DTI was in the process of agreeing a number of new high-level measures to assess the UK's performance against PSA target 2, particularly if the new measures replaced the useful and detailed measures already being used by Evidence Ltd. The new measures were published as part of the *Science and Innovation Investment Framework 2004–2014*. Some of the Evidence Ltd indicators have been adopted as targets in the Investment Framework, but many have not. For example, in measuring outputs, outcomes and productivity, the Investment Framework focuses on citations, with no measures for the total number of publications. Whilst the Evidence Ltd indicators are, on the whole, specific, measurable and comparable across countries, many of the new measures are unspecific, vague and more difficult to use in comparisons. For example, the Investment Framework sets a goal "to improve success rates in [post-16] SET" with no indication of what would constitute a sufficient improvement. Similarly, the indicator of progress for public engagement is set as "evidence of improvement" with no indication of what evidence would be acceptable.¹⁴ No explanation is given about the process of selection used by DTI in the formulation of the new basket of measures, and there is a danger that some very important detail has been omitted. For example, the focus on citation rather than publication rates masks the fact that the UK has been slipping in its global share of publications in recent years. In addition, citation rates are not a good measure of research outputs of primarily local importance.

12. The detailed indicators used by Evidence Ltd in 2003 and 2004 have been extremely useful in assessing the performance of UK science within an international context. It is

11 HC (2003–04) 316, p 9

12 Q 171 [Lord Sainsbury of Turville]

13 Ev 54

14 HM Treasury, DTI and Department for Education and Skills, *Science and Innovation Investment Framework 2004–2014* (July 2004), pp 165–166

not clear that the new high-level performance measures adopted by the Government in its Investment Framework will be either as clear or as useful. We recommend that DTI continues to use the Evidence Ltd indicators to ensure that it receives, and projects, an accurate message about the performance of its Science and Engineering Base. We further recommend that DTI does not change its indicators again without good reason in order to allow year-on-year comparison.

OST's new performance management system

13. On 7 December 2004 we held an informal meeting with Professor Sir Keith O'Nions, the Director General of the Research Councils, and other officials from OST on the developing thinking behind the formation of a new performance management system for the science and engineering Base (SEB). The purpose of such a system would be to ensure that Research Council investment maximises the potential of the SEB, particularly in meeting national economic and public service objectives. We look forward to discussing the new system with OST more formally once the details have been announced.

3 The settlement for science in 2004

Table 2: Expenditure on science (£ million)

	2001-02 Outturn	2002-03 Outturn	2003-04 Working provision	2004-05 Plans	2005-06 Plans
Total OST expenditure on science <i>of which:</i>	1,882.5	2,075.1	2,494.4	2,704.3	3,033.4
BBSRC	230.1	252.6	267.5	282.9	324.2
ESRC	74.9	77.9	94.5	104.0	119.8
EPSRC*	481.1	510.4	466.9	490.0	544.8
MRC	390.1	360.5	453.5	452.5	497.0
NERC	228.6	241.9	317.2	317.1	339.9
PPARC	219.2	249.0	264.2	273.0	292.0
CCLRC	42.7	42.6	129.9	123.4	127.8
Research Councils' pension scheme	27.0	28.5	29.7	31.1	33.2
Royal Society	26.0	28.8	29.2	31.0	32.4
Royal Academy of Engineering	4.3	4.8	5.3	5.6	5.9
Roberts Review (unallocated)	-	-	7.8	19.3	56.2
Diamond Synchrotron	4.6	14.9	41.4	82.9	52.6
Joint Infrastructure Fund	101.7	85.3	44.0	-	-
Science Research Infrastructure Fund	6.1	105.0	250.0	296.6	300.0
Capital yet to be allocated	-	-	16.3	52.4	54.4
Knowledge Transfer	-	-	-	11.8	12.3
Science Enterprise Challenge Scheme	2.5	4.8	5.0	-	-
Cambridge/MIT Institute	4.2	10.7	14.0	14.0	-
University Challenge Fund	5.9	7.3	5.0	-	-
Higher Education Innovation Fund	4.8	22.8	40.0	60.3	69.4
Exploitation of discoveries at PSREs	2.9	5.0	0.0	4.7	9.7
Foresight LINK Awards	0.4	2.5	5.0	2.0	-
OST initiatives	8.2	2.3	6.0	5.3	5.3
Delivering sustainability	-	-	-	8.4	120.5
Exchange rate and contingency reserve	-	-	2.0	36.0	36.0
Nuclear Fusion	14.3	14.6	-	-	-
Contract of association	2.9	2.9	-	-	-

* EPSRC includes figure for Nuclear Fusion

Source: Department of Trade and Industry, Departmental Report 2004, Cm 6216, April 2004, p 94

14. Table 2, above, gives a breakdown of total OST expenditure on science.

15. In 2004, the Government placed science at the heart of its political agenda with the publication of its *Science and Innovation Investment Framework 2004–2014* and the announcement of significant increases in funding for UK science. These developments were greatly needed. The 2004 report by Evidence Ltd shows that the UK is spending relatively less on research than its competitors and that the gap is growing. For both the indicators showing gross expenditure on research and development (GERD) as a proportion of GDP and publicly performed research and development (PUBERD) as a proportion of GDP, the ratio of the UK to the OST comparator group average fell in 2002 relative to the average ratio for the previous five years.¹⁵ The new round of investment announced in 2004 is therefore fundamental to ensuring that the UK Science and Engineering Base can continue to compete on a world stage.

Science and Innovation Investment Framework 2004–2014

16. The *Science and Innovation Investment Framework 2004–2014*, jointly produced by DTI, the Department for Education and Skills and HM Treasury, sets out “how we will continue to make good past under-investment in our science base”.¹⁶ The document outlines the Government’s framework for action across eight themes: challenges and opportunities for the UK science base; management of the science base; business R&D and innovation; knowledge transfer and innovation; science, engineering and technology skills; science and society; science and innovation across Government; and global partnerships, devolved administrations and the regions.

17. The Investment Framework sets some challenging new headline targets and announces a number of new measures, particularly to assist in the improvement of science teaching. Nonetheless, much of the document is dedicated to “making clear how the money that we have allocated under the Spending Review is going to be used in achieving our objectives”.¹⁷ This statement confirmed our impression that the Investment Framework was simply a consolidation of previous science policy papers, such as *Investing in Innovation*, rather than a whole new framework for science spending. Whilst it is useful to have all the elements of the Government’s thinking on science and innovation gathered together in one place, this is hardly the dazzling array of new policies anticipated before the publication of the Investment Framework. Similarly, we are not convinced that DTT’s *Five Year Programme* adds anything to the assortment of publications already in existence that deal, either in full or in part, with science policy.¹⁸

R&D as a proportion of GDP

18. The Government argues that there is a clear link between the proportion of GDP that a country spends on research and development (R&D) and productivity: “recent OECD research found that a 1 per cent growth in public R&D leads to a 0.17 per cent increase in total factor productivity in the long run”.¹⁹ UK investment in R&D currently amounts to

15 DTI, *PSA target metrics for the UK Research Base* (October 2004), p 10

16 Investment Framework, p 1

17 Q 62 [“Science Question Time”]

18 DTI, *Five Year Programme: Creating wealth from knowledge* (November 2004)

19 HM Treasury, *2004 Pre-Budget Report*, Cm 6408, December 2004, p 57

1.86%. Table 3, below, shows how this figure is broken down in comparison with the figures for France, Germany and the US:

Table 3: Public and private sector investment in R&D as a proportion of GDP

% of GDP	UK	France	Germany	US
Business	1.24	1.37	1.73	1.87
Public sector	0.62	0.83	0.78	0.80
Total	1.86	2.20	2.51	2.67

19. Perhaps the most striking target contained within the Investment Framework is that to increase UK investment in R&D as a proportion of GDP to 2.5% by 2014. Table 4, below, sets out the Government's indicative scenario for meeting this target:

Table 4: The Government's indicative scenario towards 2.5% target (R&D as % of GDP)

	2004	2014
Science Base	0.35	0.50
Other Government R&D	0.31	0.30
Private Sector	1.24	1.70
UK total	1.90	2.50

Source: HM Treasury, DTI and DfES, Science and Innovation Investment Framework 2004–2014 (July 2004), p 55

20. In the Investment Framework itself, and repeatedly in oral evidence, the Government has acknowledged that the above scenario “represents a considerable challenge both for Government and for UK business”.²⁰ Nonetheless it falls short of the Barcelona target adopted by the European Commission to increase investment in European R&D to levels approaching 3% of GDP by 2010. All the Ministers we questioned about this discrepancy agreed with the Chief Secretary to the Treasury that “it would, I suppose, have been open to us to go for the EU target, which is 3 per cent, but to be frank with you, that in our view is not a realistic one”.²¹ Lord Sainsbury told us that “I would not put any magic on 3 per cent; it is an aspirational target for the whole of Europe”.²² By contrast, a target of 2.5% was perceived to be “realistic and attainable”.²³

21. We asked Ministers if there was any chance that the Barcelona target would be met at a European level, given the UK's decision to abandon any attempt to reach the target itself. Lord Sainsbury was “doubtful of how many of the big countries in Europe will get to the 3 per cent. [It] is a target for the whole of Europe not for each individual country, because it is accepted that not all countries will get to that”.²⁴ He cited some of the Scandinavian

20 Investment Framework, p 55

21 Q 174 [Rt Hon Paul Boateng MP]

22 Q 212 [Lord Sainsbury of Turville]

23 Q 115 [Rt Hon Patricia Hewitt MP]

24 Q 176 [Lord Sainsbury of Turville]

countries as the exception because of the relatively large numbers of multinational corporations that they played host to.

22. We are surprised that the Government signed up to European targets which it does not believe that the UK has any “realistic” hope of achieving. If the UK wishes to be at the forefront of European research and development it should aspire to match the most successful of the European countries in meeting the most challenging of targets. It can only achieve this if the targets it signs up to are genuinely attainable.

23. In meeting even the lower target of 2.5% by the later date of 2014, the Government is reliant on increased investment in R&D by the private sector, over which it has only limited influence. The Secretary of State for Trade and Industry told us that the two main instruments that the Government intended to use to encourage private sector R&D were the R&D tax credit, which is discussed in paragraphs 27 and 28 below, and the investment of £178 million in the Technology Strategy, discussed in paragraphs 62 to 64 below.²⁵ Although both these measures are very encouraging, the Government has accepted that there is no guarantee that they will succeed in leveraging increased private sector investment in R&D.

24. In its indicative scenario the Government has chosen to place the greatest emphasis on improvements to be made by the private sector. By contrast, the scenario does not place any of the burden for increased investment in R&D on the sector over which it could exercise some control: Government departments. We asked the Government to explain this decision following the evidence session with Ministers on 1 November. In response we were told that the target was based on a “neutral assumption”: it “implies real terms growth in the aggregate Other Government R&D total at the trend rate of growth of the economy as a whole. We have not set overall ambitions for the more rapid growth in the aggregate level of R&D across other Government Departments as these budgets should properly be for Departments themselves to decide and to allocate within their spending review settlements”.²⁶ R&D carried out in Government departments not only yields policy benefits for those departments, but also has spin-off benefits. For example, the development of the internet arose from research carried out by the Defense Advanced Research Projects Agency (DARPA), part of the Department of Defense in the US. Furthermore, if levels of departmental R&D fall too far, there is a danger that Research Councils will be increasingly drawn into funding policy research at the expense of other research projects.

25. Given the centrality of the R&D target to the Investment Framework, the Government’s indicative scenario for its achievement assumes considerable importance. In written questions following the evidence session on 1 November we asked the Government for the basis on which the scenario and the projections contained within it were drawn up. The question seems to have been misunderstood, as the answer we received merely reiterates what we already knew: “the average annual real growth rates of $5\frac{3}{4}$ per cent implied by this scenario relates, as the text in the framework states, to both the private and public sector research bases”.²⁷ This does not explain how the figures for 2014 contained

25 Q 116

26 Ev 55

27 As above

within the scenario were arrived at. We are, therefore, unable to make a judgement as to whether or not attainment of the target is realistic.

26. It is not clear to us why the Government is able to set ambitious targets for increased private sector investment in R&D but balks at setting similarly challenging targets for its own departments. If the UK is to succeed at meeting its target of investing 2.5% of GDP in R&D by 2014 the Government needs to lead by example.

R&D tax credits

27. R&D tax credits are one of the few concrete measures that the Government has at its disposal to encourage business investment in R&D. The Investment Framework states that “there is strong academic evidence that tax incentives can increase R&D spending by an amount equal to the loss in tax revenues – every pound spent in tax support is invested by companies in additional R&D”.²⁸ In 2002–03, over 95% of eligible SMEs made a tax credit claim. The Government has given over £600 million in support since their inception.²⁹ There is a risk that the R&D tax credit will most benefit those sectors that are already strong in R&D rather than encouraging those that are not. UK business investment in R&D is currently highest in the pharmaceutical sector. Other sectors, such as mechanical engineering and aerospace spend much less on R&D.³⁰ **We recommend that the Government considers introducing sector-specific tax incentives in order to encourage the growth of R&D in those sectors that currently lag behind in this area.**

28. As the Government told us in answers to written questions, it is “too early to judge what the actual effects of the R&D tax credit have been on UK business spending on R&D. R&D decisions are long-term in nature. The desired policy outcomes, such as boosting innovation and productivity, typically emerge some years after the initial investment”.³¹ We understand that, in 2005, the Government will investigate the impact that the tax credits have had on SMEs. It will also look at their impact on the technology-based manufacturing and service sectors.³² We await the findings of these investigations with interest.

Consultation

29. As part of the process of researching and compiling the *Science and Innovation Investment Framework 2004–2014*, the Government conducted a consultation, which took place in March and April 2004 over a period of six weeks. This is only half as long as the minimum period of 12 weeks that is set out as one of the six consultation criteria in the Cabinet Office guidance on Government consultations, entitled the *Code of Practice on Consultation*.³³ Paul Boateng, the Chief Secretary to the Treasury, told us that the completed Investment Framework “represents input from a broad cross-section of

28 Investment Framework, p 65

29 HM Treasury, *2004 Pre-Budget Report*, Cm 6408, December 2004, p 58

30 Investment Framework, chart 4.1, p 56

31 Ev 49

32 HM Treasury, *2004 Pre-Budget Report*, Cm 6408, December 2004, p 58

33 Cabinet Office, *Code of Practice on Consultation* (January 2004), p 4

stakeholders, all of whom gave us a valuable insight and input into the document”.³⁴ It is not, however, obvious how the consultation responses were used in the formulation of the Investment Framework since much of the document simply brings together existing policies.

30. It is a positive sign that the Government sought the views and expert opinions of the scientific community when compiling its Investment Framework. Nonetheless, we suspect that this may have been a token gesture. Insufficient time was given for meaningful contributions to be made. It is also unclear how the submissions have helped to shape the policies outlined in the Framework. This must have been extremely disappointing for the many organisations that expended considerable resources on producing their responses within an unreasonably tight deadline. We hope that the departments involved will seek to reassure the scientific community that their contributions are valued by allowing a minimum of twelve weeks for future consultations, as recommended by the Cabinet Office.

Spending Review 2004

Table 5: Department of Trade and Industry: Spending Review 2004 settlement (£ million)

	2004–05	2005–06	2006–07	2007–08
Resource Budget	4,932	5,858	6,110	6,249
<i>Of which Administration Budget</i>	<i>427</i>	<i>449</i>	<i>414</i>	<i>404</i>
Capital Budget	160	328	480	475
Total Departmental Expenditure Limit	4,971	6,062	6,453	6,582
Department of Trade and Industry	4,818	5,267	5,445	5,689
Other bodies	153	157	152	147

Source: HM Treasury, *2004 Spending Review: New Public Spending Plans 2005–2008*, Cm 6237, July 2004, p 146

31. The publication of the *Science and Innovation Investment Framework 2004–2014* was accompanied by a substantial increase in the Science Budget. The budget for DTI is given in Table 5, above. Of its total £5.6 billion budget, the majority, £3.3 billion, will be invested in science and innovation.³⁵ This represents a growth in the DTI Science Budget of an average of 5.6% per annum in real terms over the Spending Review 2004 (SR 2004) period.³⁶ The science base will also see increased investment through the budget of the Department for Education and Skills (DfES). In total, Spending Review 2004 “provides for increased funding for the science base through DfES and DTI, such that spending on science will be over £1 billion higher in 2007–08 than in 2004–05”.³⁷ The Wellcome Trust

34 Q 160 [Rt Hon Paul Boateng MP]

35 DTI, *Five Year Programme: Creating wealth from knowledge* (November 2004), p 10

36 HM Treasury, *2004 Spending Review: New Public Spending Plans 2005–2008*, Cm 6237, July 2004, p 141

37 As above, p 142

pledged to match the increased Government funding for science by providing £1.5 billion of investment over five years.

32. It is intended that the increased funding for science should provide for:

- “shaping the science base to be more responsive to the research and skills needs of the economy, including through central funding of £35 million in 2006–07 and 2007–08 to enable Research Councils to respond more quickly and effectively to emerging priorities and opportunities;
- additional Research Council funding grants in Higher Education Institutions of £80 million in 2007–08, accompanied by further financial management reforms, to improve the sustainability of the UK’s university research base;
- measures to enhance the supply of scientists and engineers, following the recommendations of the 2002 Roberts Review in this area, by raising the average PhD stipend to £13,000 in shortage areas; raising post-doctoral salaries by £4,000 and developing a new academic fellowship scheme; and
- strengthening business-university collaboration, responding positively to the 2003 Lambert Review recommendations, including building support for knowledge transfer from universities to £110 million a year by 2007–08, and enhancing the role of RDAs in encouraging effective links between business and the research base”.³⁸

33. We received informal reports that, in the formulation of the Investment Framework, the Treasury had taken the lead, whilst OST had taken a back seat. When we asked Ministers about these reports in oral evidence on 1 November, the Rt Hon Paul Boateng told us that “David Sainsbury needs no driving in the promotion of science, technology and innovation; so the DTI certainly was not driven”.³⁹ We also enquired whether the new money for science would mean greater control by the Treasury over how the funds were spent. However, the Chief Secretary to the Treasury told us that “fortunately, David Sainsbury and Kim Howells have substantial allocations under this particular Spending Review, and in the context of this framework; and it will be for them to decide within those allocations how the spending will be delivered”.⁴⁰ Since DTI and DfES have expertise in the area, it is only appropriate that they should determine how the new funds are spent.

34. As with elsewhere in Government, increases in funding for science are tied to undertakings to make efficiency gains. DTI will secure “at least £380 million in efficiency gains by 2007–08”. These efficiency gains will entail a reduction of 1,010 Civil Service posts in core DTI, 200 in UK Trade and Investment and 270 in other bodies, by 2007–08.⁴¹ We were assured by the Secretary of State that, because science is a priority policy area, OST will experience “rather fewer job cuts” than other sections of the department.⁴² **Given the substantial increases in the Science Budget, it is important that DTI retains sufficient**

38 As above, pp 142–143

39 Q 161 [Rt Hon Paul Boateng MP]

40 Q 164 [Rt Hon Paul Boateng MP]

41 “Spending Review 2004”, HM Treasury press notice A10, 12 July 2004

42 Q 157

staff capacity within OST to manage and administer the new funds. We intend to monitor this situation closely.

4 Research

Research Councils

35. Research Council income in the form of grant-in-aid from OST accounts for a total of 66.7% of the Science Budget. Table 6, below, shows how this expenditure is broken down by Research Council:

Table 6: Research Councils' income from grant-in-aid as a percentage of Councils' total gross expenditure and the total Science Budget 2003–04

Research Council	% of Councils' total expenditure	% of total Science Budget
BBSRC	96.4	10.8
ESRC	98.3	3.8
EPSRC	108.0	19.0
MRC	75.3	14.7
NERC	65.0	8.3
PPARC	74.6	9.5
CCLRC	8.0	0.6

Source: Department of Trade and Industry, *Departmental Report 2004, Cm 6216, April 2004, p 86*

36. As part of our scrutiny of OST's associated public bodies we set ourselves the objective of holding a separate scrutiny session with each of the seven Research Councils during the course of the current Parliament. We published our Report on the work of the seventh, the Economic and Social Research Council, in December 2004.⁴³ In 2004 we also published a short Report on our introductory session with the new Director General of the Research Councils (DGRC), Professor Sir Keith O'Nions.⁴⁴ The material dealt with in these Reports is not repeated here.

37. Research Councils UK (RCUK), the umbrella body that represents the seven Research Councils, was launched in May 2002. It is led by the Research Councils UK Strategy Group, the membership of which comprises the Chief Executives of the Research Councils and the DGRC. An internal review conducted in April and May 2003 concluded that the body had made a promising start in the delivery of its objectives. OST published a further review in July 2004 which was, again, broadly positive about the role and work of RCUK.⁴⁵ We will

43 First Report of the Committee, Session 2004–05, *The Work of the Economic and Social Research Council*, HC 13. See also First Report of the Committee, Session 2002–03, *The Work of the Particle Physics and Astronomy Research Council*, HC 161; Third Report of the Committee, Session 2002–03, *The Work of the Medical Research Council*, HC 132; Fifth Report of the Committee, Session 2002–03, *The Work of the Natural Environment Research Council*, HC 674; Ninth Report of the Committee, Session 2002–03, *The Work of the Engineering and Physical Sciences Research Council*, HC 936; Third Report of the Committee, Session 2003–04, *The Work of the Biotechnology and Biological Sciences Research Council*, HC 6; Eighth Report of the Committee, Session 2003–04, *The Work of the Council for the Central Laboratory of the Research Councils*, HC 462.

44 Ninth Report of the Committee, Session 2003–04, *Director General for the Research Councils: Introductory Hearing*, HC 577

45 OST, *OST Review of Research Councils UK* (July 2004)

examine the 2004 review in detail, along with the relationship between RCUK, the Research Councils and OST, when RCUK gives oral evidence to us early in 2005 as the concluding part of our rolling programme of scrutiny of the Research Councils.

Research funding

38. In our Scrutiny Report 2003 we expressed concern that responsive mode funding may be cut back in order to ensure the success of large strategic cross-Council funding programmes. In 2004 the *Science and Innovation Investment Framework 2004–2014* emphasised the importance of transferring knowledge out from the science base into business and industry, in order to support and increase UK productivity. Whilst the increased investment in science heralded in the Investment Framework is welcome, we are concerned that the emphasis on “harnessing innovation” to improve the UK’s “wealth creation prospects” may lead to a disproportionate increase in Government support for strategic and applied research at the expense of basic research, funded in responsive mode.⁴⁶

39. In oral evidence, Ministers stated that the Government was still committed to funding basic research in responsive mode. The Chief Secretary to the Treasury told us that “the [funding] process has to be science driven. It is nothing if it is not science driven, and the last thing that the Treasury seeks to do is in any way to prejudice or interfere with that drive”.⁴⁷ There was, however, some confusion about the boundary between basic and applied research. Dr Kim Howells told us that “it is becoming increasingly difficult to differentiate between pure research and applied research or the application of science”.⁴⁸ This statement is puzzling given that Research Councils differentiate between pure and applied research for funding purposes as a matter of routine. **Whilst we appreciate that the distinction between basic and applied research is not always clear cut, particularly when basic research leads to unexpected applications, it is important that the Government is mindful of the danger that an increased emphasis on wealth creation could lead to a decrease in the volume of basic research that is funded. It is at the basic level that some of the most important scientific developments take place, and this research should not be neglected in the rush to generate concrete outputs.**

Full economic cost

40. In May 2003, DTI published *The Sustainability of University Research: A consultation on reforming parts of the Dual Support System*.⁴⁹ The document contained proposals for increasing the proportion of the “full economic cost” of research paid by the Research Councils. The full economic cost is the total cost to Higher Education Institution (HEI) of an activity or project, taking into account both direct and indirect costs. It “includes the

46 Investment Framework, p 5

47 Q 167 [Rt Hon Paul Boateng MP]

48 Q 168 [Dr Kim Howells]

49 DTI, *The Sustainability of University Research: a consultation on reforming parts of the Dual Support system* (May 2003)

costs of all staff time spent on the activity, and an appropriate share of the costs of maintaining and developing relevant aspects of the research infrastructure”.⁵⁰

41. Research Councils currently pay HEIs all the direct costs of a research project, but only a contribution towards the indirect costs.⁵¹ In 1990–2000, for example, of the £528 million spent by Research Councils on research grants, the contribution towards indirect costs amounted to approximately £113 million.⁵² As far as we are aware, the Government has nowhere stated what proportion of the full economic cost of research this represents. However, working from the limited sources available to us, it is reasonable to assume that Research Councils currently pay an average of 63% of the full economic cost.⁵³ The proportion of the indirect costs of research that have not been met by the research funder are intended to be derived from the block grant awarded to individual HEIs by the Funding Councils (QR funding).⁵⁴ Taken together, these two funding streams had been expected to cover the full economic cost of research. In recent years, however, increases in QR funding have not kept pace with increases in Research Council budgets and the volume of research being conducted. In the Investment Framework, the Government estimates that the shortfall amounts to £0.8–1 billion per year.⁵⁵

42. As part of Spending Review 2004, the Government confirmed the changes that it would be making to the Dual Support System to make it more sustainable:

“In the light of responses received and subsequent consultation with stakeholders, the Government have decided as follows:

- Research Councils will pay a single percentage [...] of full economic costs (FEC) for almost all types of grants for research projects and programmes. [...] Research Councils will include time spent by permanent academic staff, as calculated using the extended TRAC methodology;⁵⁶
- Research students will continue to be excluded from the FEC regime for the time being. This will be revisited when TRAC has been successfully extended to teaching;
- The additional resources allocated in Spending Reviews for Research Councils to pay a greater proportion of the costs of research (£120 million from Spending Review 2002 and a further £80 million from 2007–08 allocated in SR04) will be

50 DTI, *The Sustainability of University Research: a consultation on reforming parts of the Dual Support system* (May 2003), p 5

51 In its consultation document, DTI states that Research Councils make “a contribution to HEIs’ indirect costs of research, in proportion to the costs of the additional staff employed on projects. The present contribution stands at 46% of such costs”. DTI, *The Sustainability of University Research: a consultation on reforming parts of the Dual Support system* (May 2003), p 12

52 As above

53 See in particular HC Deb, 15 July 2004, col 568W

54 DTI states that it has been generally accepted that QR funding should cover: “1) the salary-related costs of permanent academic researchers; 2) a contribution to the costs of training new researchers; 3) the resources to pursue some “blue skies” research; and 4) the resources to build research capabilities (support staff, basic consumables and infrastructure”. DTI, *The Sustainability of University Research: a consultation on reforming parts of the Dual Support system* (May 2003), p 11

55 Investment Framework, p 38

56 TRAC is a methodology to enable higher education institutions to calculate the full economic costs of research. It will be rolled out to all UK universities by January 2005.

allocated between Research Councils from 2006–07 in such a way as to preserve the current balance of research volume. Detailed modelling is currently underway; an announcement will be made when this has been completed.”⁵⁷

43. It was originally estimated that, under the new model, Research Councils would be expected to pay between 60% and 70% of the full economic cost of the research projects that they fund.⁵⁸ This does not represent a substantial increase on the 63% that we estimate is currently paid by the Research Councils (see paragraph 41, above). In a letter from Lord Sainsbury to Vice Chancellors, dated 6 January 2005, it was revealed that the proportion of the full economic cost of research paid by Research Councils would be 80%. In addition, where equipment, survey or similar costs on a research grant exceeded £50,000, the cost above this figure would be paid in full by the Research Councils, thus relieving some of the pressure on QR funds.⁵⁹

44. The revised funding mechanisms do not address the shortfall in funds to meet the indirect costs of research projects funded by organizations other than the Research Councils, for example, charities and the EU. Research charities have tended to argue that the indirect costs of the research that they fund should be met by Government. In the Investment Framework, the Government states that “subject to the continued progress of charity funding towards sustainability, the Government will develop an additional element of QR funding to support charity research funding”.⁶⁰ For this purpose the Government will make available £90 million by 2007–08 through QR funding, based on charitable income. This is in addition to the £90 million which is currently distributed in England on the basis of charitable income. The Government is not making similar funds available through QR funding to support EU-funded research. **We commend the Government for making funds available to support the indirect costs of research funded by the charitable sector. On the same principle, we recommend that the Government makes funds available to support the indirect costs of EU-funded research. This is vital to ensuring that the universities in the UK continue to take on research projects funded at a European level.**

45. The reforms to the Dual Support System are less radical than might be supposed. For the most part, the system will operate as at present. Ministers told us that the key characteristics of the reformed system were:

- i. The block grant will continue to be used to pay the overhead costs of research (albeit a smaller proportion of these costs): “of course, the situation is not that you have to rely on Research Council funding for the full economic cost of a project. That is what QR money is for, to provide the other side of this in terms of the overhead costs”.⁶¹

57 HC Deb, 15 July 2004, col 568W

58 Q 188 [Lord Sainsbury of Turville]

59 “Higher Education Research”, Letter from Lord Sainsbury of Turville to Vice Chancellors, 6 January 2005

60 Investment Framework, p 43

61 Q 188 [Lord Sainsbury of Turville]

- ii. The increased funds from the Research Councils will free up some of the QR funding currently used to pay research overheads, thus giving Vice Chancellors “a high degree of autonomy in deciding strategic objectives”.⁶²
- iii. The TRAC methodology will encourage better financial planning in universities: “we are saying that you should know what the full economic costs are, and in going for projects you should have available to you ways of making up the difference through QR money or other money”.⁶³

In other words, the reforms are designed, not to challenge the principle of dual support, but to release some of the tension in an overstretched system.

46. On the surface, the Research Councils appear to benefit from the Government’s focus on science. They will receive £80 million in 2007–08 on top of the £120 million allocated to them in Spending Review 2002. In his letter to Vice Chancellors, however, Lord Sainsbury makes it clear that the initial £120 million will only be used to provide extra support to existing research grants, not to fund additional research projects.⁶⁴ This answers a question that we directed to Ministers in writing following our evidence session of 1 November. At that time, the Ministers were unable to tell us exactly what the additional funds would be used for.⁶⁵ It is not yet clear whether the £80 million of funding in 2007–08 can be used to support additional research projects, or whether it will all be entirely consumed in the drive towards sustainability. Neither has it been made clear whether or not the additional funds will be sufficient to ensure that the volume of research supported can remain constant.

47. The additional funds allocated to the Research Councils for 2005–06 and 2007–08 are welcome. Given the opacity of the data supplied by Government on this issue, however, we are unable to judge whether or not the additional funds will be sufficient to enable the Research Councils to sustain the current volume of research supported when they move to paying 80% of the full economic cost. We urge the Government to ensure that Research Councils can maintain their current portfolio of research projects even whilst moving towards paying the full economic cost of that research.

62 Fourth Special Report of the Committee, Session 2003–04, *Government Response to the Committee’s Fourth Report, Session 2003–04, The Office of Science and Technology: Scrutiny Report 2003*, HC 588, p 6

63 Q 190 [Lord Sainsbury of Turville]

64 “Higher Education Research”, Letter from Lord Sainsbury of Turville to Vice Chancellors, 6 January 2005

65 Ev 56

5 Science careers and training

Research careers

48. In the *Science and Innovation Investment Framework 2004–2014*, the Government states that it will “seek to work with employers to encourage and enable a reduction in the current reliance on short-term research contracts. In particular this will require incentives for better strategic planning and continued professional development”.⁶⁶ Short-term research contracts in science and engineering are a longstanding concern of this Committee.⁶⁷ In our Scrutiny Report 2003 we welcomed the introduction of the Academic Fellowship initiative, which is designed to enable Research Councils to intervene directly to create more stable careers for the researchers that they support.⁶⁸ We note that the drive towards sustainability in research funding should give universities greater financial stability, and the flexibility to use QR funding to put more staff on permanent contracts.

49. In oral evidence, the Science Minister has told us on a number of occasions that the problems relating to short-term contracts will be greatly reduced as a result of the introduction of the EU Fixed Term Work Directive: “we have not made a huge amount of progress, but the situation will be radically changed with the new EU Directive, which will make it much more difficult and will affect this issue”.⁶⁹ Following the evidence session on 1 November we asked Ministers what evidence the Government had to support this heavy reliance on the EU Directive. We were told that

“We have no evidence at this stage of the effect that the Fixed Term Work Directive has had on short-term research contracts. [...] We have no plans for any specific monitoring of the use of fixed-term contracts in higher education, but HEFCE will be reporting to the Department on the wider issue of workforce trends in the new year, and the Research Careers Committee (chaired by Sir Gareth Roberts and led by the Office of Science and Technology) will monitor trends relating to research careers, which will include the impact of the Fixed-Term regulations.”⁷⁰

We are concerned that the Government’s reliance on the benefits to be reaped from the EU Fixed Term Work Directive is preventing them from pursuing other UK-based means of securing a reduction in the number of short-term research contracts in science and engineering. **We welcome the studies on workforce trends to be carried out by HEFCE and the Research Careers Committee and hope that the Government will respond rapidly to any findings that they produce. However, the Government needs to have a number of policy ideas at its fingertips should these studies identify a continuing problem with short-term research contracts in science and engineering. We are very concerned that an over-reliance on the benefits to be realised from the introduction of**

66 Investment Framework, p 97

67 Eighth Report of the Committee, Session 2001–02, *Short-Term Research Contracts in Science and Engineering*, HC 1046

68 HC (2003–04) 316, p 15

69 Q 214 [Lord Sainsbury of Turville]

70 Ev 56

the EU Fixed Term Work Directive will hold back any new Government initiatives to address this problem.

Women in science

50. The *Science and Innovation Investment Framework 2004–2014* identifies a “clear correlation between under-representation of women [in science careers] and skills shortages”.⁷¹ The difficulties experienced by women undertaking careers in science are well known, particularly since the publication of *SET Fair* (“the Greenfield Report”).⁷² Principal among them are the disadvantages incurred by taking a career break. In our Report, *Scientific Publications: Free for all?* we noted that, without access to scientific journals, women on career breaks frequently lost touch with developments in their subject, making it difficult for them to return to work.⁷³

51. In oral evidence, Lord Sainsbury told us that “we are very clear that we do need to improve significantly the position of women in science careers”.⁷⁴ In response to *SET Fair*, the Government announced, in April 2003, plans for a new Resource Centre for Women in science and technology. A £3.9 million contract to run the Centre was awarded by OST to the JIVE consortium, which is led by Bradford College and Sheffield Hallam University and includes Cambridge University and the Open University. The Centre will work with employers and organisations in the sector, advising them on how to generate the cultural and structural changes needed to enable women to reach their full potential in scientific careers. There will be additional funding for the return to work programme. **The Government is to be commended for the establishment of a new Resource Centre for Women in S&T. We look forward to receiving updates on its progress.**

University science provision

52. We have long been concerned that the trend towards research concentration in a small number of institutions might lead to the closure of some science departments, particularly in chemistry, physics, engineering and mathematics. In our Scrutiny Report 2003 we noted that the disappearance of such departments from some regions could prevent some students from pursuing these subjects to degree level. We are also concerned that a lack of regional research capacity in some subjects could hamper the Government in its support of university-business links at a regional level, and could harm the economy and local services. In our Scrutiny Report 2003 we recommended that, in order to maintain sufficient demand for these subjects, “the Government should consider establishing bursaries for undergraduates to study shortage subjects, such as physical sciences and

71 Investment Framework, p 98

72 Report from the Baroness Greenfield to the Secretary of State for Trade and Industry, *SET Fair: A Report on Women in Science, Engineering and Technology* (November 2002)

73 Tenth Report of the Science and Technology Committee, Session 2003–04, *Scientific Publications: Free for all?*, HC 399, p 76

74 Q 37 [“Science Question Time”]

engineering. These should cover the full cost of the charged top-up fee”.⁷⁵ This approach was dismissed by the Government in its Response.⁷⁶

53. In 2004 the Government has taken a number of steps to address this problem. In a speech to Universities UK, the then Secretary of State for Education and Skills, Charles Clarke, said that “there are numerous examples where rational market decisions by individual institutions don’t necessarily meet the wider regional or national interests. We need to take into account subjects which simply can’t be dealt with completely through the laws of supply and demand”.⁷⁷ HEFCE have proposed a number of measures to help prevent the closure of university departments of strategic national or regional importance, including a requirement for universities to give a period of notice before closing a department; and the possibility of HEFCE providing additional funding to departments if there is a powerful case that falling provision in a particular region would hinder student access to important disciplines. In our Report on our introductory session with the Director General for Higher Education, Professor Sir Alan Wilson, we noted that “the Director General for Higher Education needs to be clear about what his role is in intervening”.⁷⁸ HEFCE’s proposals establish the principle of Government intervention and represents a significant shift in policy. **We welcome HEFCE’s tacit, if belated, acknowledgement that Government intervention may be necessary to secure adequate provision of university science teaching at a regional and national level. We hope that it will act swiftly to ensure that the problem does not get any worse.**

54. The measures detailed above did not prevent Exeter University from announcing, in November 2004, that it would be closing its chemistry department, as well as its departments of Italian and music. In December we met informally with the Vice Chancellor of Exeter University, Professor Steve Smith, to discuss the reasons underlying the University’s decision to close its chemistry department. Government answers to questions about the closure of Exeter University’s chemistry department have all reinforced the view that “higher education institutions (HEIs) are autonomous organisations and as such are responsible for their own academic direction and strategic use of funds. The decision to close undergraduate chemistry provision is therefore a matter for Exeter University alone”.⁷⁹ This answer fails to acknowledge the Government’s responsibility for ensuring that there is adequate chemistry provision at a national, or even regional, level, an omission that is inconsistent with HEFCE’s acknowledgment of the principle of Government intervention. **The Committee remains concerned about the strategic provision of science subjects in English universities. We announced an inquiry into this issue on 21 December 2004, and will be taking written and oral evidence early in 2005.**

75 HC (2003–04) 316, pp 25, 28

76 HC (2003–04) 588, p 8

77 Charles Clarke, Secretary of State’s Speech at the Universities UK Residential, 15 September 2004

78 Seventh Report of the Committee, Session 2003–04, *Director General for Higher Education: Introductory Hearing*, HC 461, para 8

79 HC Deb, 14 December 2004, col 1054W

6 Science across Government

Science Review Directorate

55. Science is used across Government departments: to inform new policies, or as part of the policies themselves. In response to a recommendation in the Government's science strategy, *Investing in Innovation*, the Government's Chief Scientific Adviser (CSA), Sir David King, set up a Science Review Directorate within OST. The Directorate has undertaken a rolling programme of reviews to externally scrutinise and benchmark the quality and use of science in Government departments. In its assessment of each department the Directorate focuses on ten broad areas:

- Horizon scanning: to identify future science-related issues;
- The development of a clear, overall science strategy;
- The review and harnessing of existing research with a view to identifying gaps and opportunities for future research;
- The commissioning and management of new research;
- Quality assurance of department-sponsored work, and an assessment of its relevance;
- The use of research and scientific advice in policy formation;
- The open publication of results and open debate of findings;
- The sharing, transferral and management of knowledge;
- The implementation of Guidelines 2000 and the Code of Practice for Scientific Advisory Committees; and
- The use, maintenance and development of scientific expertise (within the department itself, and in the scientific community (capacity and capability building)).

OST's initial aim was to review three or four departments each year, completing the first cycle of reviews within three to four years. It was anticipated that each review would take approximately ten months. The reports resulting from the reviews would be made public.

Department for Culture, Media and Sport

56. The first review undertaken by the Science Review Directorate was of the Department for Culture, Media and Sport (DCMS). The review began in May 2003. It lasted much longer than the scheduled ten months: the final report was not published until 14 October 2004. We asked OST to explain why the review took longer than expected. We were told that "although it was announced in May 2003, assembling the new team and firming up the review process meant that the review did not actually get underway until August 2003. We then found that each stage took longer with DCMS than we had expected – and they were not stages that overlapped". Although OST stated that "getting value out of the process for each Department and Government more widely" would be the main driver, "not

timescales”, it was not anticipated that future reviews would take any longer than ten months to complete. In future reviews, consultants will be employed to carry out most of the fieldwork, and the department will impose clearer and tighter project management methods.⁸⁰

57. The Science Review Directorate’s review of DCMS found a number of problems with the department’s treatment and use of science, particularly “hard”, as opposed to social, science.⁸¹ This is not altogether surprising, given the necessarily low science content of the output of DCMS relative to that of some other departments. The review recommended that DCMS appoint a senior part time Chief Scientific Adviser to “ensure that the science needs of DCMS are strategically addressed and that science and scientific advice form an effective part of the evidence base for policy-making and delivery, dealing with both substance and process”.⁸² We understand that DCMS is actively pursuing this recommendation. The Committee has, in the past, been very supportive of the role played by departmental Chief Scientific Advisers and was instrumental to the creation of such a post at the Department for International Development.⁸³

58. The Science Review Directorate’s study of DCMS has yielded some useful recommendations, particularly if they lead to the appointment of a Chief Scientific Adviser to the department. Nonetheless, we are concerned that the programme of reviews will lose momentum and influence if there are not marked improvements to the process. We are also keen that OST should focus on the departments with a high science content at an early stage in the review cycle.

80 Ev 57

81 Office of Science and Technology, *Science Review of the Department for Culture, Media and Sport* (October 2004), p 9

82 As above, p 15

83 Thirteenth Report of the Committee, Session 2003–04, *The Use of Science in UK International Development Policy*, HC 133-II, Q 507

7 Innovation and knowledge transfer

59. The *Science and Innovation Investment Framework 2004–2014* has knowledge transfer at the heart of its agenda: “UK business has access to a science base that is excellent, but there is an economic imperative to make sure that scientific knowledge is used by business to create wealth”.⁸⁴ In total, DTI spends approximately £300 million on knowledge transfer each year. Table 7, below, shows how this expenditure is broken down:

Table 7: DTI expenditure on knowledge transfer (£ million)

	2002–03 Outturn	2003–04 Working provision	2004–05 Plans	2005–06 Plans
TOTAL <i>of which:</i>	337.3	283.7	341.2	361.5
Knowledge Transfer	136.8	109.9	150.6	159.2
Exploitation of Investment in Science Base	51.6	64.0	80.0	91.4
Technical Infrastructure	63.8	76.9	77.7	78.0
Space – BNSC	85.1	32.9	32.9	32.9

Source: Department of Trade and Industry, *Departmental Report 2004, Cm 6216, April 2004, p 49*

Regional Development Agencies

60. The Lambert Review of Business-University Collaboration has prompted Government to give the Regional Development Agencies (RDAs) a greater role to play in the promotion of business-university links. The Committee has in the past expressed doubts about the scientific capabilities of the RDAs.⁸⁵ Similarly, witnesses to the 2003 inquiry by the House of Lords Science and Technology Committee into Science and the RDAs expressed concerns about their lack of scientific and innovation based expertise. Our contacts with businesses and universities in the UK have tended to reinforce this view, although there are good examples in some regions, such as the North East and the North West. The House of Lords Committee called for the RDAs to review their capabilities in this area.⁸⁶ We understand that the level of expenditure on science, engineering and technology is variable across the regions.

61. Since the above criticisms were made, however, the Government has taken a number of steps to improve the scientific capabilities of the RDAs. The Science Minister told us that, by the end of 2004, all the RDAs would have established Science and Industry Councils “with on the whole good people on them representing both academics and industry”.⁸⁷

84 Investment Strategy, p 69

85 Fifth Report of the Committee, Session 2003–04, *Too little too late?: Government Investment in Nanotechnology*, HC 56, para 66

86 Second Report of the House of Lords Science and Technology Committee, Session 2003–04, *Science and the RDAs: follow-up*, HL 103

87 Q 191 [Lord Sainsbury of Turville]

Collectively the RDAs invested £250 million in science, engineering and technology-related activities in 2002–03, representing approximately 15% of their budgets.⁸⁸ **It is too early to tell whether or not the establishment of Science and Industry Councils within RDAs will improve their performance on science, engineering and technology-related matters. We look forward to reviewing the situation in next year’s Scrutiny Report, when the Councils will have been in operation for a year.**

Technology Strategy

62. The Innovation Report, published in early 2004, identified the need for the Government to adopt a more strategic approach to technology innovation. The Government has promised to use the new Technology Strategy to achieve this goal. The Strategy is designed to provide “a business-driven framework for identifying emerging technologies which will have a significant impact on sectors where the UK has the potential to exploit such technology and the research capacity to maintain a leading global position, as well as deriving wider economic, social or environmental benefits”.⁸⁹ DTI’s various business support schemes have been rationalized to allow the redirection of funds towards technological innovation. These funds will be spent in line with the Technology Strategy and administered by a Technology Strategy Board.⁹⁰ DTI has pledged to invest at least an annual £178 million in the Technology Strategy by 2007–08.⁹¹

63. The new business-led Technology Strategy Board was appointed in October 2004. It is chaired by Graham Spittle, Director of IBM’s Hursley Laboratory. The remainder of the membership consists of five further representatives from business, all recruited through open competition; two venture capitalists with a technology interest; one regional representative with a background in business and one Research Council Chief Executive, representing the interests of all the Research Councils. A number of Government officials will also sit on the Board.⁹² The Technology Strategy Board first met on 1 November 2004.

64. The new Technology Strategy is a step in the right direction, and the attendant rationalization of DTI’s existing business support schemes is welcome, if overdue. In particular, we welcome the tacit acknowledgement that civil servants in Whitehall are not necessarily best placed to identify opportunities for investment in innovation.

88 Investment Strategy, p 143

89 As above, p 70

90 Q 1 [“Science Question Time”]

91 HM Treasury, *2004 Spending Review: New Public Spending Plans 2005–2008*, Cm 6237, July 2004, p 141

92 Ev 53

8 Energy

65. Although the broader issue of energy falls within the remits of the Department for the Environment, Food and Rural Affairs (DEFRA) and DTI, OST has a role in supporting research into alternative sources of energy. It also has a responsibility to ensure that policy makers and the public are well informed about the scientific basis for the debate about energy, particularly in relation to climate change. In 2004 this debate moved further up the political agenda when the Government's Chief Scientific Adviser, Sir David King, and the Prime Minister made speeches on climate change and energy that were widely reported in the press.

66. DTI's PSA target 4 sets out Government's aim to reduce CO₂ emissions by 20% below 1990 levels by 2010.⁹³ In the Ninth Annual Zuckerman Lecture, held at the Royal Society, Sir David King stated that, if the UK did not achieve a nuclear power rebuild by 2020, the amount of nuclear power on the grid would be reduced from the current figure of 27% to approximately 20%. Under these circumstances, even if the volume of energy produced from renewable sources were increased from the current level of 3% to a level of 20%, our dependence on fossil fuels would remain the same as it is now.⁹⁴

67. These statistics suggest an urgent need for the UK to build up a nuclear capacity in order to meet the Government's energy targets. The Government has not yet, however, made its position on the future of nuclear energy clear. In his July appearance before the Liaison Committee, the Prime Minister stated that "you cannot remove [nuclear energy] from the agenda if you are serious about climate change".⁹⁵ Nonetheless, the Energy White Paper states that efforts should be concentrated on energy efficiency and renewables rather than on nuclear. When we asked the Secretary of State for Trade and Industry to outline the timetable for policy formation on nuclear power we were not given a timetable but were told instead that the Government "recognizes that nuclear power is currently an important source of carbon free electricity, but its economics make it an unattractive generation option and there are important issues for nuclear waste to be resolved".⁹⁶ The high cost of nuclear power relative to renewables was disputed in a report by the Royal Academy of Engineering, *The Cost of Generating Electricity*.⁹⁷ The Prime Minister implied that the lack of strategic direction in the Government's policy on nuclear energy may be a result of low public confidence in nuclear fuels.⁹⁸

68. The Government should not avoid taking difficult strategic decisions in order to avoid criticism. It should lead the debate and make the public aware of the long-term energy situation as well as the options for dealing with it.

93 HM Treasury, *2004 Spending Review: Public Service Agreements 2005–2008*, Cm 6238, July 2004, p 31

94 A full text and summary of the speech is available on the OST website: www.ost.gov.uk

95 House of Commons Liaison Committee, Session 2003–04, *The Prime Minister: Oral and written Evidence: Oral evidence taken on Tuesday 6 July 2004*, HC 310-ii, Q 207

96 Ev 51

97 Royal Academy of Engineering, *The Cost of Generating Electricity: A Commentary* (March 2004)

98 Liaison Committee, HC (2003–04) 310-ii, Q 202

The International Tokamak Experimental Reactor

69. Nuclear fusion presents one of the cleanest and most efficient possibilities for future nuclear energy generation. The International Tokamak Experimental Reactor (ITER) would act as a test of the feasibility of building a commercial nuclear fusion plant and would potentially produce 500MW of power. It is expected to cost 4.5 billion Euros (£3 billion), and would take ten years to build. If the experiment went well, it is estimated that power generation through nuclear fusion could take place in the next 25–30 years. ITER is to be funded by the EU, Japan, China, South Korea, Russia and the US.

70. Work on ITER cannot begin in earnest until a location for the reactor has been decided. A recent gathering at the International Atomic Energy Agency in Vienna to discuss the location of ITER ended in deadlock. The two sites under consideration are Rokkasho-mura in Japan and Cadarache in France. At present the US and South Korea support the Japanese bid whilst China and Russia back Cadarache. In our Scrutiny Report 2003 we urged the Government to press the French case and to “resist any suggestion that the ITER project should somehow be split between France and Japan”.⁹⁹ In response, the Government stated that it was “firmly behind hosting ITER in Europe; it is doing all that it can to ensure the European bid succeeds”.¹⁰⁰ When we asked the Secretary of State for Trade and Industry about the location of ITER, the message was not as clear. Although she stated that “I do think having two ITERs would be counter-productive”; this followed a remark that “I think the best approach for this wider ITER programme might well be to have facilities located both in Japan and in Europe”.¹⁰¹ **We would welcome reassurance that the Government is still wholeheartedly convinced of the need to press the case for ITER to be located on a single site, preferably in Europe.**

71. The debate about the location of ITER is stalling progress on the project. We were pleased to note that the Science Minister appears to be aware of the need to resolve the deadlock as soon as possible, since the decision would have “huge implications for the funding of fusion research in Europe”.¹⁰² In December he told us that “I would hope that we could agree fairly quickly to go ahead on a six-party basis, that means within the next three or four months, and then have things sorted out technically by the middle of next year”.¹⁰³ **The location of ITER needs to be resolved as a matter of urgency in order to avoid any further delays to the commencement of this very important project. We hope that the Government will push for a resolution to discussions by the end of March 2005, the possible timescale identified by Lord Sainsbury.**

99 HC (2003–04) 316, p 20

100 HC (2003–04) 588, p 5

101 Qq 129, 128

102 Q 47 [“Science Question Time”]

103 Q 269 [“Science Question Time”]

9 Science and Society

72. Within Government, OST has responsibility for public engagement with science and technology through its Science and Society Directorate. The Directorate was established in July 2003, and it has an “overarching strategic cross-departmental role”.¹⁰⁴ In DTI’s *Departmental Report 2004*, the Government stressed the importance of the Directorate’s function:

“the Government wants to ensure it has a society that is confident about the governance, regulation and use of S&T and an environment where scientists continue to have a clear ‘licence to practice’ from the public. To do this, decision-makers must follow best practice in public engagement and dialogue, and in the regulation, commissioning and use of research. The Government must ensure that there is a healthy supply of the brightest and best people for post-graduate and post-doctoral S&T research in academia and industry in all key areas.”¹⁰⁵

The emphasis placed on the importance of the Directorate’s role notwithstanding, we were concerned by the Secretary of State’s suggestion, in oral evidence, that this would be one of the areas in the Department to be cut back following the Government’s efficiency drive for the Civil Service. She told us that “on the Science in Society Programme, we think that by combining our efforts more effectively with outside organisations, we can deploy people more effectively”.¹⁰⁶

73. Whilst we welcome any attempt by OST to ensure that its science and society programmes function effectively, we are not convinced that outsourcing this work is the answer. If the public is to be confident about the “governance, regulation and use of S&T”, the Government needs to be actively involved in public engagement and dialogue.

Animal rights extremism

74. One of our ongoing concerns in 2004 has been the safety of people who work for organisations that carry out research using animals. Responsibility for this resides with the Home Office; but many of those threatened with violence by animal rights protesters are funded through OST. An indication of the importance that OST ascribes to the issue of the use of animals in research was given when Ministerial responsibility for the new National Centre for Replacement, Refinement and Reduction of Animals in Research was transferred from the Home Office to OST.

75. In Science Question Time sessions we have repeatedly asked Lord Sainsbury about what measures the Government is taking to protect people who work for organisations that use animals in research. In July the Science Minister told us that “the absolute primary requirement now is stepping up the police action on this. Within the last few weeks there has been a major stepping up of this. We now have a senior person, whose sole job it is to

¹⁰⁴ DTI, *Departmental Report 2004*, Cm 6216, April 2004, p 88

¹⁰⁵ As above, p 87

¹⁰⁶ Q 156

deal with animal rights extremists and coordinating all the actions of both the police and the National Crime Squad and the intelligence services”.¹⁰⁷ In December 2004 we were pleased to note the introduction in Parliament of the Serious Organised Crime and Police Bill.¹⁰⁸ The Bill would create new police powers to arrest individuals protesting outside someone’s home; giving the police powers to “ban protesters from the vicinity of a person’s home for three months; and strengthening the harassment laws to deal with campaigns of harassment aimed at groups of people working for the same company”.¹⁰⁹ It is not clear what measures will be introduced to tackle the question of economic sabotage. The Science Minister told us that “we are trying to formulate a couple of proposals in this area. As you will appreciate, it is a difficult area”.¹¹⁰

76. We welcome the introduction in Parliament of the Serious Organised Crime and Police Bill. We hope, however, that the Government will include measures to guard against economic sabotage in its raft of measures to tackle crime against people and organisations, and their suppliers and contractors, that legitimately conduct research using animals.

107 Q 111 [“Science Question Time”]

108 *Serious Organised Crime and Police Bill* [Bill 5 (2004–05)]

109 DTI, *Five Year Programme: Creating Wealth from Knowledge*, November 2004, p 17

110 Q 256 [“Science Question Time”]

10 Conclusion

77. The Government's *Science and Innovation Investment Strategy 2004–2014* and the Spending Review that it accompanied are welcome news for the UK scientific community. These developments give science the emphasis that it deserves on the political agenda. OST has taken several positive steps to address many of the issues raised in our 2003 Report on its work. The Government has set itself several ambitious science policy targets, most notably to dramatically increase investment in R&D as a proportion of GDP. If this target is to be met, the Government will have to look at taking action close to home, as well as asking the private sector to make improvements. OST should also look carefully at some of the unintended consequences of otherwise very positive new science policies. We look forward to assessing the impact of 2004's additional investment in science in years to come.

Conclusions and recommendations

1. Performance indicators inevitably tell us as much about past decisions as they do about the current situation. We hope that the areas in which the UK's performance is now suffering due to previous underinvestment will remind the Government of the importance of continuing to increase its investment in science, even when improvements are unlikely to be seen in the short term. This is key to ensuring that the UK does not slip further against the performance of other countries in future years. (Paragraph 10)
2. The detailed indicators used by Evidence Ltd in 2003 and 2004 have been extremely useful in assessing the performance of UK science within an international context. It is not clear that the new high-level performance measures adopted by the Government in its Investment Framework will be either as clear or as useful. We recommend that DTI continues to use the Evidence Ltd indicators to ensure that it receives, and projects, an accurate message about the performance of its Science and Engineering Base. We further recommend that DTI does not change its indicators again without good reason in order to allow year-on-year comparison. (Paragraph 12)
3. We are surprised that the Government signed up to European targets which it does not believe that the UK has any "realistic" hope of achieving. If the UK wishes to be at the forefront of European research and development it should aspire to match the most successful of the European countries in meeting the most challenging of targets. It can only achieve this if the targets it signs up to are genuinely attainable. (Paragraph 22)
4. It is not clear to us why the Government is able to set ambitious targets for increased private sector investment in R&D but balks at setting similarly challenging targets for its own departments. If the UK is to succeed at meeting its target of investing 2.5% of GDP in R&D by 2014 the Government needs to lead by example. (Paragraph 26)
5. We recommend that the Government considers introducing sector-specific tax incentives in order to encourage the growth of R&D in those sectors that currently lag behind in this area. (Paragraph 27)
6. It is a positive sign that the Government sought the views and expert opinions of the scientific community when compiling its Investment Framework. Nonetheless, we suspect that this may have been a token gesture. Insufficient time was given for meaningful contributions to be made. It is also unclear how the submissions have helped to shape the policies outlined in the Framework. This must have been extremely disappointing for the many organisations that expended considerable resources on producing their responses within an unreasonably tight deadline. We hope that the departments involved will seek to reassure the scientific community that their contributions are valued by allowing a minimum of twelve weeks for future consultations, as recommended by the Cabinet Office. (Paragraph 30)

7. Given the substantial increases in the Science Budget, it is important that DTI retains sufficient staff capacity within OST to manage and administer the new funds. We intend to monitor this situation closely. (Paragraph 34)
8. Whilst we appreciate that the distinction between basic and applied research is not always clear cut, particularly when basic research leads to unexpected applications, it is important that the Government is mindful of the danger that an increased emphasis on wealth creation could lead to a decrease in the volume of basic research that is funded. It is at the basic level that some of the most important scientific developments take place, and this research should not be neglected in the rush to generate concrete outputs. (Paragraph 39)
9. We commend the Government for making funds available to support the indirect costs of research funded by the charitable sector. On the same principle, we recommend that the Government makes funds available to support the indirect costs of EU-funded research. This is vital to ensuring that the universities in the UK continue to take on research projects funded at a European level. (Paragraph 44)
10. The additional funds allocated to the Research Councils for 2005–06 and 2007–08 are welcome. Given the opacity of the data supplied by Government on this issue, however, we are unable to judge whether or not the additional funds will be sufficient to enable the Research Councils to sustain the current volume of research supported when they move to paying 80% of the full economic cost. We urge the Government to ensure that Research Councils can maintain their current portfolio of research projects even whilst moving towards paying the full economic cost of that research. (Paragraph 47)
11. We welcome the studies on workforce trends to be carried out by HEFCE and the Research Careers Committee and hope that the Government will respond rapidly to any findings that they produce. However, the Government needs to have a number of policy ideas at its fingertips should these studies identify a continuing problem with short-term research contracts in science and engineering. We are very concerned that an over-reliance on the benefits to be realised from the introduction of the EU Fixed Term Work Directive will hold back any new Government initiatives to address this problem. (Paragraph 49)
12. The Government is to be commended for the establishment of a new Resource Centre for Women in S&T. We look forward to receiving updates on its progress. (Paragraph 51)
13. We welcome HEFCE's tacit, if belated, acknowledgement that Government intervention may be necessary to secure adequate provision of university science teaching at a regional and national level. We hope that it will act swiftly to ensure that the problem does not get any worse. (Paragraph 53)
14. The Committee remains concerned about the strategic provision of science subjects in English universities. We announced an inquiry into this issue on 21 December 2004, and will be taking written and oral evidence early in 2005. (Paragraph 54)

15. The Science Review Directorate's study of DCMS has yielded some useful recommendations, particularly if they lead to the appointment of a Chief Scientific Adviser to the department. Nonetheless, we are concerned that the programme of reviews will lose momentum and influence if there are not marked improvements to the process. We are also keen that OST should focus on the departments with a high science content at an early stage in the review cycle. (Paragraph 58)
16. It is too early to tell whether or not the establishment of Science and Industry Councils within RDAs will improve their performance on science, engineering and technology-related matters. We look forward to reviewing the situation in next year's Scrutiny Report, when the Councils will have been in operation for a year. (Paragraph 61)
17. The new Technology Strategy is a step in the right direction, and the attendant rationalization of DTI's existing business support schemes is welcome, if overdue. In particular, we welcome the tacit acknowledgement that civil servants in Whitehall are not necessarily best placed to identify opportunities for investment in innovation. (Paragraph 64)
18. The Government should not avoid taking difficult strategic decisions in order to avoid criticism. It should lead the debate and make the public aware of the long-term energy situation as well as the options for dealing with it. (Paragraph 68)
19. We would welcome reassurance that the Government is still wholeheartedly convinced of the need to press the case for ITER to be located on a single site, preferably in Europe. (Paragraph 70)
20. The location of ITER needs to be resolved as a matter of urgency in order to avoid any further delays to the commencement of this very important project. We hope that the Government will push for a resolution to discussions by the end of March 2005, the possible timescale identified by Lord Sainsbury. (Paragraph 71)
21. Whilst we welcome any attempt by OST to ensure that its science and society programmes function effectively, we are not convinced that outsourcing this work is the answer. If the public is to be confident about the "governance, regulation and use of S&T", the Government needs to be actively involved in public engagement and dialogue. (Paragraph 73)
22. We welcome the introduction in Parliament of the Serious Organised Crime and Police Bill. We hope, however, that the Government will include measures to guard against economic sabotage in its raft of measures to tackle crime against people and organisations, and their suppliers and contractors, that legitimately conduct research using animals. (Paragraph 76)

Formal minutes

Wednesday 19 January 2005

Members present:

Dr Ian Gibson, in the Chair

Dr Evan Harris
Dr Brian Iddon

Mr Robert Key
Dr Desmond Turner

The Committee deliberated.

Draft Report (Office of Science and Technology: Scrutiny Report 2004), proposed by the Chairman, brought up and read.

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

Paragraphs 1 to 77 read and agreed to.

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

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

[Adjourned till Wednesday 26 January at nine o'clock.]

Witnesses

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Wednesday 14 July 2004

Lord Sainsbury of Turville, Parliamentary Under-Secretary of State for Science and Innovation, Department of Trade and Industry Ev 13

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Rt Hon Patricia Hewitt MP, Secretary of State for Trade and Industry, Department of Trade and Industry Ev 20

Monday 1 November 2001

Rt Hon Paul Boateng MP, Chief Secretary, HM Treasury, **Dr Kim Howells MP**, Minister of State, Department for Education and Skills, and **Lord Sainsbury of Turville**, Parliamentary Under-Secretary of State for Science and Innovation, Department of Trade and Industry Ev 28

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Seventh Report	Light Pollution and Astronomy <i>(Reply HC 127, 2003-04)</i>	HC 747
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Ninth Report	The Work of the Engineering and Physical Sciences Research Council. <i>(Reply HC 169, 2003-04)</i>	HC 936

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Fifth Report	Government Funding of the Scientific Learned Societies <i>(Reply HC 53)</i>	HC 774
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Eighth Report	Short-Term Research Contracts in Science and Engineering <i>(Reply HC 442)</i>	HC 1046

Oral evidence

Taken before the Science and Technology Committee

on Monday 9 February 2004

Members present:

Dr Ian Gibson, in the Chair

Dr Evan Harris
Dr Brian Iddon
Mr Robert Key

Mr Tony McWalter
Bob Spink
Dr Desmond Turner

Witness: **Lord Sainsbury of Turville**, a Member of the House of Lords, Parliamentary Under-Secretary of State for Science and Technology, Science and Innovation, Department of Trade and Industry, examined.

Q1 Chairman: Thank you, Lord Sainsbury, for coming along today to help us with this rather novel experience. I hope it is going to be very useful because we might be able to feed some of the information into our scrutiny of OST for 2004. How we thought we would do it is give you the questions beforehand to give you a chance to answer. We will do it in the spirit of the House of Commons and I will play the Speaker (always an ambition), so you will have short sharp answers and then we will have a supplementary or two—no more than two—for each question. Minister, how much money will be realized from the rationalization of business support schemes over the next three years? How will this money be re-allocated; and how much new money will be made available to implement the Innovation Report?

Lord Sainsbury of Turville: The rationalization of the schemes run by the Department has allowed £150 million to be redirected towards technological innovation. This money will be committed over the twelve months from April 2004 to April 2005 and will be spent over four years. It will be allocated by the Technology Strategy Board in line with the new Technology Strategy which has been developed with the DTI working with industry. The Innovation Report sets out new priorities for the DTI and the money will be allocated from current budgets to implement it.

Q2 Chairman: The supplementary to that would be, what is new about this? What is different? We have heard of innovation for a long time now; we have heard about foresight. Is there a dramatic change of strategy in your reply?

Lord Sainsbury of Turville: I hope there is a different approach. I think in the past we have tended, with our business support schemes and work on innovation, to respond in a very ad hoc way to proposals that have come forward from particular industry sectors or in line with a particular technology need. I think this has not been a very effective way and really this whole exercise is about making certain that we use the money we have in a much more effective way. The point of the Technology Strategy is to just to say where are the priority areas that we have and then to work very

clearly with those industries to formulate what are the strategic technology platforms in those particular areas and fund those.

Q3 Chairman: Are you trying to focus particular spending on certain areas of technology? Are you picking winners?

Lord Sainsbury of Turville: I think it is a question of priorities. I think where we are looking at putting money behind development of technology in particular areas then it is important to be clear that a) you are addressing an important segment of British industry, and b) it is an area of technological development which is considered really important by that industry to help them gain competitive advantage. It makes not sense at all just to do this on an ad hoc basis as projects come forward. We want to be very clear what are the priorities and that industry really buys into this because we see this as a way not simply of improving the supply side but actually using public money to drive forward the demand from industry.

Q4 Chairman: Question two: What was the role of OST and MRC in the events surrounding the decision by Cambridge University to cancel plans to build a primate research laboratory; and what are the implications for biomedical research in the UK?

Lord Sainsbury of Turville: The decision to cancel plans to build a primate research laboratory was taken by Cambridge University, although OST and MRC were closely in touch with the discussions. The Government is determined that this discussion will not impact on the ability of the UK to remain a world leader in neuroscience and we are exploring ways to ensure that the University has the facilities it needs to continue its important work in neuroscience. The Government is committed to the protection of those scientists and research staff undertaking neuroscience work. We have given the police tough powers to tackle animal rights extremists; brought in restrictions on directors' personal details appearing on company records; and a specialist police unit based with the National Crime Squad is targeting the leaders of violent animal rights protest groups. We are also deciding what additional powers are necessary.

Q5 Mr Key: Minister, can I first say how very relieved a lot of us were by your very robust remarks reported in the *Sunday Times* where you say: “This decision at Cambridge is not going to be a blow because we are determined to make certain that it is not and we will make sure that certain other facilities are available to Cambridge”. You might like to tell us how you are going to develop those. Could you also enlarge on the comments on the new legislation which you say is being studied in the Home Office? This would be warmly welcome. There are, of course, federal and state laws in the United States which do exactly this and I, for one, believe that the time has come to enact particular legislation in this area.

Lord Sainsbury of Turville: So far as the first question is concerned, I have already got Colin Blakemore (who is the Chief Executive of the MRC) and Sir Keith O’Nions (who is the new Director General of the Research Council) looking at this, also in conjunction with the Wellcome Trust who obviously have a great interest in this because they were our partners in the project in Cambridge. They are already looking at that and we have a meeting arranged to look at the possibilities. As you might expect, I would not want to go into exactly where these are or what form they would take, which has to be decided anyway. As far as the legislation is concerned, there has been a proposal put forward by a number of bodies interested in this for a new bill which would specifically cover this area. Quite a large part of that is already covered by legislation which is already in existence and it makes no sense and it would not be allowed to have legislation which duplicates other legislation which already exists. What we are doing is going through that to pick out all those things which would be new powers or would be changes in existing powers which we think would be helpful. We will then see what comes out of that and then take it forward. Clearly you cannot have a bill that duplicates what already exists.

Q6 Dr Harris: This Cambridge business was a bit of a dog’s business, was it not? Would you agree that it is a disaster because it has given a victory to animal rights extremists which they need not have had? Is the Government planning to say that this will not be allowed to happen again and underwrite the costs of security when these threats come in the attempt to close down lawful—and often government sponsored, government required—research?

Lord Sainsbury of Turville: I think it is very unfortunate because it will introduce a delay, but even then I do not think it will hold up much research which is on-going at this point. It will not be a disaster because we will simply make certain that there are other facilities to continue this work. As far as security for other facilities are concerned, I do not think that the Government can get involved in guaranteeing the security costs either on capital or revenue going forward, but obviously to the extent that people put up new facilities or renovate them, these kind of costs will have to be part of the costs which will then have to be funded.

Q7 Chairman: Question three: What wider scientific benefits from the Beagle 2 project were anticipated when the decision to provide financial support to the project was made? Have these benefits been realized and at what cost to public funds?

Lord Sainsbury of Turville: The Beagle 2 mission cost £42.5 million, of which £22 million was directly from public funds. The scientific objective was to establish whether life is present—or has been present—on a planet other than earth. It has enabled UK industry to develop expertise in robotic exploration and a UK university to develop expertise in miniaturisation and mass spectrometry. It is a project that has captured public imagination, demonstrating that this is possible without a human presence in space.

Q8 Dr Turner: Could you tell us, Lord Sainsbury, something about the background of the decision to support the Beagle project? Can you tell us what scientific benefits were expected from Beagle—had it spoken to us—which were not part of the US mission to Mars?

Lord Sainsbury of Turville: Clearly it was very much more directed to this question of life being present on a planet other than the earth. That is why it had the ability to do the mass spectrometry. That was more advanced than what was in the American project which I think is there simply to find out whether there is water which could have led to life. It was, in that sense, a very far-sighted and a very interesting scientific attempt to discover whether there has been life on Mars. Clearly it is extremely disappointing that we have not had the signals back, but, as I say, it did enable us to develop some interesting technology for robotic exploration and mass spectrometry. Of course, the ability to have a mass spectrometer of this kind of size—which is shoebox size rather than a room—has actually some other very interesting applications in medicine outside this field. Of course, I think the final thing is that it captured the public imagination. I always thought it would, but not to the extent it did. I believe that the near future of space exploration is going to be about robotic exploration. We, in this country, have some real skills in this and I think Beagle 2 has pushed that forward. We need to make certain that in the future, through ESA programmes, that kind of robotic exploration is taken forward.

Q9 Dr Turner: Can you expand a little on the applications of technology that have been evolved to go into the instrumentation that the Beagle carried? Do you foresee some commercial exploitation of these applications for the future?

Lord Sainsbury of Turville: As I said, I think the mass spectrometer is a very good example of this, where something which usually has to go in something the size of a room can be reduced to what is effectively a shoe box size. Of course, that makes it something that you could actually move round different parts of a hospital. I think within medicine there is a move to make more and more something which can be done quickly and flexibly so that is potentially a very interesting bit of technology.

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Q10 Chairman: Question four: What is the expected impact of the proposed EU Chemicals Legislation on innovation in the sector? What opportunities are there for the UK?

Lord Sainsbury of Turville: There are three potential benefits. REACH includes generous exemptions for R&D and new products and processes, five years initially with a possible further five year extension. The threshold starts at one tonne which is higher than the threshold that currently applies for new chemicals. It could also have an impact on encouraging the development of new substitute chemicals. However, as currently drafted, there are also risks that some low production volume chemicals could be withdrawn from market because of the costs and administrative complexity of REACH.

Q11 Dr Iddon: Lord Sainsbury, how far apart do you think the Green NGOs and the chemical industry are now and what are the other main hurdles that they have to get over if REACH is going to be a practical proposition?

Lord Sainsbury of Turville: I think we have actually moved much closer together with Greenpeace and World Wildlife Fund on this. Equally, I think, the chemical industry is closer to this point as well. The two issues which are still important are more emphasis on prioritisation and also the question of one chemical one registration. I think we believe that if you are going to get any sense into this you need to have a system where each chemical is only registered once and there is one lot of testing and everyone who wants to use that chemical comes together and does that one testing. The advantage of this is that you stop the duplication of testing so we would cut down very strongly on animal experimentation. Also, of course, you avoid the situation where different groups get different results from the research they do. It seems to me that it has the final advantage that if you have one cost for registering it then you could use this when you come to have imports; you could say that if you want to import this chemical you must pay the same fee as the people who did the test originally. I think one chemical one registration is something and there is no reason why that should be a disagreement between ourselves and either the chemical industry or the various chemical interest groups. Prioritisation is a slightly more controversial issue but again I think there is beginning to be agreement round this, that it does not make sense just prioritising on the size of the tonnage; you should prioritise on what the evidence would suggest would be the most dangerous chemicals initially and these are the bio-cumulative ones and so on. Again I think there is beginning to be agreement, certainly within this country, that that is also the right thing to do. If you look at it from the point of view of the consumer, this has to be right. They are not very interested in whether there are a hundred tonnes or a hundred thousand tonnes; what they want to know is which are the ones which, from the evidence we have already, are likely to be the serious ones.

Q12 Dr Iddon: My second supplementary is about the future of chemistry in British universities. We have had a long series of closures of chemistry departments and just in the last few months we have seen the following three mentioned: closure of chemistry at King's College, closure of chemistry at Queen Mary College in London and now, tragically, an announcement in the last few days, that one of the highest ranking chemistry departments is about to close and that is Swansea. Are you as concerned about all these haemorrhaging of principal departments in universities as I am and, if so, what do you think the Government can do about it?

Lord Sainsbury of Turville: I think it is a very serious situation and we have to see whether there is more we can do. At the end of the day it comes back to the number of students who want to do chemistry. We cannot order people to do chemistry; we can only inspire them and excite them to do this. That is why I think the question of schemes like the Science and Engineering Ambassador Scheme and, indeed, our network of Science Learning Centres are extremely important. At the end of the day it comes back to exciting young people about chemistry. I think there is also, for the various professional institutes and government, a major communication issue which is to convey the message that chemistry and the chemical industry is not part of the old economy; it is very much part of the exciting new world we are going into and that speciality chemicals and areas like that are fundamental to some of the most exciting things that are going to happen in science in the future. I think there is a big communication issue to be confronted there.

Q13 Chairman: Question five: What role will the OST's Science and Society Directorate play in shaping new school science curricula?

Lord Sainsbury of Turville: The OST is very concerned that young people should be encouraged that young people should be encouraged to take up careers in science and technology. We therefore work closely with DfES on activities to inspire children by complementing their work on curriculum subjects. In particular we are continuing to support the Setnet scheme which co-ordinates the UK wide network of 53 set points at a task with ensuring that science and technology activities are made available to schools. Setnet also operates the Science and Engineering Ambassadors Programme which encourages young scientists and engineers to visit schools to explain about their work. This is proving to be a very successful initiative. The number of Science and Engineering Ambassadors has increased from 657 in December 2002 to the current figure of over 5000. Of these, some 35% are women and about 40% are under 35 years old.

Q14 Mr McWalter: To what extent are you addressing the report of this Committee about science education, particularly claims that current GCSE courses are overloaded with factual content, they contain little contemporary science, they have stultifying assessment arrangements and they are

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differentially difficult compared to other subjects, particularly when the latter lack mathematical content?

Lord Sainsbury of Turville: The basic responsibility lies with DfES and not the Office of Science and Technology. Our role has to be to play a sort of parallel role in terms of encouraging children to do science. I am stepping outside my departmental brief in saying that a lot of work has been done on this field by the DfES in terms of the key stages, and particularly in terms of introducing more general science questions into those.

Q15 Mr McWalter: Am I right to infer that you do not pro-actively seek to advise DfES on its science educational policy, you just sort of sit back and wait to be consulted?

Lord Sainsbury of Turville: It is not our responsibility and it is also not our skills to do curriculum development. What we know about the officials in OST is about science policy and not about science education. That clearly has to be the responsibility of DfES.

Q16 Chairman: Question six: What plans have you got to encourage the MRC, the NHS and other research funders to co-ordinate their activities in order to focus research on areas which will have the most benefits for patients?

Lord Sainsbury of Turville: One of the main recommendations in the Bioscience Innovation and Growth Team reports have published in November was that a Clinical Trials Agency should be set up. Likewise, in October, the Academy of Medical Science report recommended that Clinical Trial and Translational Research Network be established. Lord Warner and I asked Sir John Pattison to chair a working group—the Research for Patients' Benefit Working Party—to look at how to improve the way scientific breakthroughs are turned into treatment for patients. We asked the working party to produce a report by Easter. They have made excellent progress and on Friday sent an interim report to Lord Warner and myself.

Q17 Dr Harris: Is it a happy situation that there have been year on year cuts in the research budget of the NHS, that there is less access to clinical trials in this country than comparable countries for patients, and that there is an on-going crisis in academic medicine with so many unfilled chairs?

Lord Sainsbury of Turville: I think this is a very key area of importance and that is why this working party is really going to look into what we can do in the field of clinical research. We have very arduous requirements of people to do that and this may not be very sensible so Sir John Pattison's group is also looking at that area. I agree, it is extremely important.

Q18 Mr Key: The Medical Research Council is clearly very concerned about clinical research and they have an initiative with industry and other

funders to try to promote clinical research. As far as the Government is concerned, do you see this as a priority for science spending in the OST?

Lord Sainsbury of Turville: I think it is extremely important because we are not simply in the business of doing research; we also want to see that actually used for improving health care and, indeed, for the strength of our industry in pharmaceuticals and biotech. It is interesting that this proposal came out first from the Biotech Innovation and Growth Team. We are very keen to support this and I think there is also a lot of support from the Department of Health also because there is no doubt that it improves care if there is good clinical medicine going on.

Q19 Dr Harris: I want to bring you back to the issue of animal work. My constituents think that you are a great minister for science and so forth, but they are not happy at the moment because there was a headline in the *Oxford Mail* that stated that there was going to be this threat against an animal facility in Oxford. If an MP was ever threatened with security issues to try to prevent them from speaking out—as is their right—then there would be funding for enhanced security I would imagine. Why is it that the Government should not say, because it is our regulation, it is our requirement—indeed we encourage this—that we will not allow the threat of security to otherwise undermine the viability of a university (or, indeed, a local police force) and we will deter this sort of approach by protestors by underwriting the security of these facilities that you regard as so necessary?

Lord Sainsbury of Turville: Where there have been particular situations—as at Cambridge—additional funds have been given to the local police to deal with this situation. Obviously one has to think very carefully before one makes it a rule that every university animal facility or anyone who is threatened will have constant police protection.

Q20 Dr Harris: But you would consider it.

Lord Sainsbury of Turville: We will always consider the particular circumstances but to make a general rule, when you look at the number of pharmaceuticals companies, biotech companies, university departments, I think one has to do this very carefully with the police rather than saying we will make a general rule about this.

Q21 Mr Key: Minister, do you agree that even if the Government were to facilitate this sort of work using animals in a secure military establishment, that it would not be sufficient because it is not just the place that is under attack from these people, it is the scientists themselves, their families, their suppliers, their insurers, their bankers and this is something which is quite a new phenomenon and at the moment some of these government establishments, for example, is met by the military defence and yet the Home Office will not pick up the bill for security and a lot of scientists are still having—even though

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they have retired—to pay out of their own pocket and pension for their own security. I do hope that you would support any moves to revisit this area.

Lord Sainsbury of Turville: It seems to me that the fundamental question there is about two things: one is to make certain we have the proper legislative framework to deal with this. As I said, we are looking at things like the legislation about home visits and so on. The second thing is to make certain that the police have the resources and the organisation to really target the rather small number of people who are involved in this kind of violent behaviour. I think those are the two things we need to concentrate on and we are totally committed to doing that.

Chairman: I would like people to follow up on some of the things now as we have about five minutes. Does anybody want to follow up on anything?

Q22 Dr Iddon: I would like to follow up on the closures of chemistry departments, Minister. Certainly the falling numbers of students wanting to read chemistry at university is a factor, as you rightly said. However, if I could focus on Swansea that is not the case. The applications by students to attend Swansea University to read chemistry are excellent. They are also cloying their way very successfully up the old RAE exercise. They have won awards recently in green chemistry; they are the only department doing green chemistry in the country. They are a centre of excellence for mass spectrometry. Could I put it to you that the ratio of 1.7 compared with one for arts and four for medicine is now wrong for the modern age and we need to look at this ratio very seriously if we are going to prevent the closure of further science departments, not just chemistry departments?

Lord Sainsbury of Turville: I will certainly look at whether that is the issue, the issue being on the teaching side, is it? Or on the research side?

Q23 Dr Iddon: It is the HEFCW ratio I am talking about.

Lord Sainsbury of Turville: I will certainly look at that. Where there have been moves to change it, one needs to look very carefully that it is right and I will certainly look at whether that ratio is correct. My own impression is that the biggest problems as cross-science has come from the question of people doing research where the money, if you take it from the project funding and you put it together with the HEFCW money we know does not cover the full cost of running a department. We have begun, with the last spending review, to try to get it on a more sustainable basis and I hope we are going to do something more in this next spending review. We know this is a problem and we know that universities are having to find money from other activities to cover it.

Q24 Dr Turner: Lord Sainsbury, it has been put to us that there is a caveat to the apparently excellent principle in REACH of one chemical and one registration, that caveat being that you cannot ignore the process by which the chemical is produced because there may be various processes to produce

given chemicals and different processes may produce different trace contaminants, some of which can potentially be exceedingly toxic. Would you agree that that possibility has to be guarded against in the protocol?

Lord Sainsbury of Turville: It is not a point I have heard raised before so I would need to think about that. I think we will have this problem anyway because it is not only about chemicals but it is the use of chemicals. We will have to deal with this issue anyway, that a chemical may be tested for one use but may be used for something else. However, I do not think that distracts from the basic principle of one chemical one registration, as opposed to having five different groups doing the same testing across Europe for exactly the same purpose which strikes me as expensive and unhelpful and will lead to a lot of genuine confusion and games playing because people will say they want to have a group with other people and another person will say that it does not suit them to do that and he wants to do it on his own. We want to avoid all that and just say that there is one registration for each chemical and one lot of testing.

Q25 Mr McWalter: Why is it that in the House of Commons, when we ask a question about arts, we can get the whole scenario to be considered whereas when I asked you a question about science education it was somebody else's business really? Do you not think it would be a sensible thing if we had a ministry for science which actually integrated the educational requirements and the research requirements and looked at the industrial consequences and so on in such a way that we actually had a sort of single tier of supportive mechanism and would that not in part mean that the recent HEFCE ratios which lost science £22 million because of slight changes in those ratios which prejudiced science, that would not happen if you had an united science ministry rather than one lot of people looking at the industrial side and another lot of people looking at the educational side.

Lord Sainsbury of Turville: My own view is that you can always move the building blocks around and say that we will take all science into one ministry of science, but when you do that you immediately open up another set of interfaces so that someone asks the question why are you not having a proper integration between the Ministry of Science and its courses and the Ministry of Arts in terms of running schools, and is it not ridiculous that at this school you have one ministry looking after half the school and another ministry looking after the other half of the school. I do not think people will ever find any arrangement of ministries which can be done in such a way that you do not have interfaces. The important thing is not to spend time re-arranging the building blocks but to actually make certain that you have good joined up government and a good relationship between departments.

Q26 Chairman: The Chief Scientific Advisor to the Government recently said that the global warming climate change was a bigger threat to mankind than terrorism. Do you agree with that?

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Lord Sainsbury of Turville: I do not think it is a matter of scientific decision making. I think it also depends on what timeframe you use. Long term, I do not think there can be any doubt that if what we think will

happen on global warming happens, that is a much more serious threat to mankind than terrorism. In the short term clearly that is not the case.

Chairman: Minister, thank you very much indeed for this first session. We will advance it and we hope to see you again.

Wednesday 12 May 2004

Members present:

Dr Ian Gibson, in the Chair

Dr Evan Harris
Mr Robert Key
Mr Tony McWalter

Bob Spink
Dr Desmond Turner

Witness: Lord Sainsbury of Turville, a Member of the House of Lords, Parliamentary Under-Secretary of State for Science and Innovation, Department of Trade and Industry, examined.

Q27 Chairman: Good morning, Minister. Thank you very much for turning up again at a second hearing. Let me first of all apologise for the absence of some of my colleagues. They obviously are having trouble on the tube; if not, they will be met with the savagery of my tongue at some point this morning for not being here. It is not going to deflect us from the enjoyment of this session. I hope we can help to get answers to some of the questions not only from us personally but from the scientific community who were invited to write to us. I think most of the questions come from them, so there are people out there to whom we are all speaking. I note that it said in *The Guardian* the other day that you are expected to quit the DTI. I wondered, first of all, if you would like to comment on that, but certainly to ask if that has anything to do with the increasing role, as it seems, of the Treasury in determining, sanctioning, supporting or not scientific and technology policy in this country. Perhaps they have a Minister of Science within there. I wonder if you would like to comment on what seems to be an obvious, welcome move, but which has serious repercussions for the organisation of science in the parliamentary domain.

Lord Sainsbury of Turville: Taking those questions—

Q28 Chairman: In any order.

Lord Sainsbury of Turville: I have no plans to retire. I am very happy in my job. I think it is a splendid job. I continue to do it. It would be nice at some point in the future to have my life back but for the moment I am extremely happy and enjoying doing the job. As far as the Treasury is concerned, my position is very much that the fact that the Treasury and, indeed, the Chancellor are now taking a great deal of interest in the science budget is greatly to be welcomed. The work we have done in recent years to argue the case for science and particularly the role it can play in both innovation and therefore wealth creation and the quality of our lives, I think those arguments are being increasingly accepted. I think the fact that the Chancellor has taken a real interest in this area is all good news for science.

Q29 Chairman: Do you think the six-week consultation period is enough, too short, too long? Does this indicate that perhaps the Treasury has an agenda already in terms of the priorities in science funding through this spending review?

Lord Sainsbury of Turville: I think we have done a great deal of consultation recently. I think it has all been, as a whole, rather productive. There is still, particularly in the case of industry, some consultation which needed to be doing and the main focus will be on that area as part of the consultation.

Q30 Chairman: What do you anticipate will happen? Do you think the Treasury will allocate the funding to specific issues? Indeed, to give one example, will it say, “No more beagles”?

Lord Sainsbury of Turville: As far as particular areas of science are concerned, it was probably right in the last spending review and the one before that to be clear about one or two of the new areas of science because the case we had made for increasing the science budget was that there had in fact, because of the tightness of funds, been a lack of movement into key new areas. Having made that case, I think it was perfectly fair that money should very specifically be allocated to those areas. I think that situation has now rather changed. We are not in a position where we have not moved into key new areas, as we were in that period, so I do not think there is an issue of saying particular science areas should have money, though I think it is fundamental to this kind of spending review exercise that the OST does say what are the priorities as we see it and seek to persuade the Treasury that those are all-important priorities. I take that process very seriously. If one says it is an absolute key requirement that we increase, for example, PhD stipends, then it seems to me rather absurd to turn round and say, “Having got the money, we are going to spend it on something else.” I think you have to have that discussion which goes into some detail.

Q31 Chairman: Will the Research Councils, through the OST, of course, still have the same influence on policy determination then in the face of Treasury real interest?

Lord Sainsbury of Turville: I think there is a distinction between areas of science and particular policy areas like PhD stipends or other issues like that. Clearly, as I said, where we have made a particular case for a particular kind of expenditure then we will do that, but when it comes to decisions about where the money is spent on scientific projects, that, I think, is for the Research Councils.

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Q32 Chairman: In your job remit, at what point did the Treasury and you get together and this great interest by the Treasury, which we are all very happy with, suddenly come about? When was the key event? Or has it been a gradual accumulation of pressures?

Lord Sainsbury of Turville: I think I have been banging on about this for five years now and we are beginning to get some progress. But I do not think there was one particular moment where they suddenly said, "This is interesting." In fairness to the Treasury, I think there was a realisation, even before in fact I became Science Minister, that there had been a catastrophic decline in science spending in the 10 years before 1997 and that something needed to be done about it. Through the various spending reviews and other reviews we have had, we have had endless discussions about this and I think as a whole that has been productive discussion.

Q33 Dr Turner: Short-term contract research workers are still sadly with us. Could you tell us about your plans to improve career opportunities for scientific researchers?

Lord Sainsbury of Turville: We have taken a number of measures here. We have obviously increased during the current spending review the average Research Council post-doctoral salary by £4,000 in areas where there is experience in recruitment. We have just launched the major new academic fellowship scheme, which is aimed to improve the career structure for researchers, and of course the introduction of the EU Directive on fixed term contracts will have the effect of making HEIs provide better career support for young researchers. Of course, very importantly, under the new Funders' Forum, there will be a sub-group which looks at this. Sir Gareth Roberts will be chairing that, so he will be continuing the excellent work he has done on this area in the future.

Q34 Dr Turner: It is good to hear there are some changes in the pipeline, I must say. The deadline for applications from universities for the new academic fellowships closes in two days. How many have you received so far? Has it performed to expectations? Are you disappointed or pleased?

Lord Sainsbury of Turville: I have to say I have not seen any numbers for that but I do not think there will be any problem about filling those posts.

Q35 Dr Turner: Could you expand on the impact of the Fixed Term Work Directive, not only on the careers of the scientists involved but on the departments in which they are working and the funding implications for those departments?

Lord Sainsbury of Turville: I believe the vast increase of short-term contracts was due to the uncertainties about university funding. In those circumstances, the vice-chancellors essentially took the line they needed the flexibility of short-term contracts in order to deal with situations where they did not get research funds or there was a downturn in that. I think the Directive makes it the situation that no longer are short-term contracts particularly

financially advantageous, because if you make someone redundant in those circumstances the fact that he only has a short-term contract will not particularly help you. I think it will encourage vice-chancellors to look at having more people currently on short-term contracts on a long-term basis, which is highly desirable.

Q36 Dr Turner: Is it not also likely to reduce the actual number of researchers because clearly a vice-chancellor is not going to approve an appointment if he cannot see a continuing funding stream for it.

Lord Sainsbury of Turville: I think this is where hopefully the longer time horizons we are giving to these things means that the vice-chancellors can have greater certainty about this. I am hoping very much that that, combined with the EU Directive, will mean that there are less short-term contracts. I hope also the work HEFCE have been doing on the human relations side for researchers will also have a pay-off. It is neither desirable from a scientific point of view particularly nor for the individuals concerned that people do go through innumerable post-doc contracts without ever having any long-term security. I think that is bad for human relations practices and there should be much more consultation with individuals to say at a particular point in their career, "You are not going to get long-term employment. Should you not be looking at many of the other opportunities that exist?" not least of all so that new post-docs coming through can get the positions.

Q37 Mr McWalter: I would like to ask questions about women in science. In some ways I think many of the problems and difficulties we have in still having so few women entering science and even fewer making it to the upper levels, however you define age profiles, opportunities and so on, is a microcosm, an illustration, of many of the things that go wrong, including even the issues about contracts that women particularly suffer from. Why is it that we still have this problem about women coming into science? What can be done about it?

Lord Sainsbury of Turville: We are very clear that we do need to improve significantly the position of women in science careers. We have vastly increased the resources going into this area, so, as part of a £4.5 million package covering the next three years, I have announced that we have awarded £3.9 million contract for the new resource centre for women in SET which will work with key SET employers and organisations to do work in this area. That is going to champion good employment practice, support schemes for mentoring and networking, develop an expert women's database to be used to identify more women to be on SET public policy boards, so I think we are now putting in a really concentrated effort to change this. We will need to see whether this is sufficient to change something which of course is deeply culturally embedded.

Mr McWalter: I am not sure it is that deep culturally. If a woman is doing a post-doctoral work and is at the age also when she wants to start a family, it sounded to me from the response you made

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to my colleague as if somebody at some stage is going to come along and say, "Well, you probably have not got a long term future, maybe you had better think about doing something else." Whereas my own view would be that if somebody has reached that level of attainment, then, for instance, a part-time but tenured lectureship, so that they keep in touch with the particular portion of the subject in which they have been specialising and continue to be able to make contributions to that but not have the huge and crushing burden of huge amounts of coursework to mark and exams to mark—

Chairman: Could you ask the question because time is pressing.

Q38 Mr McWalter: If you were able to do something like that, a structural change of that sort, it may be much more responsive than the mechanisms that you have mentioned.

Lord Sainsbury of Turville: Could I make it clear that the last comment was not about people coming back into science or doing a first post-doc but about people who have done five or six post-docs. This is people who have been doing this for a number of years and still do not have the security they need to have. That was not about the sort of people I think we are talking about here, women who have got their PhD, maybe have done some post-doc work, go off and have a family—and I think there is a particular problem in science here, which is with things moving very fast—where the question is on having returner schemes and so on to get them back in. That is one of the things that the resource centre for women will be doing. That is the key issue there, I think.

Q39 Mr McWalter: We have lots of women in science. Imperial College tell us that over half their PhD students are women and yet somehow we lose them and you do not envisage any structural change in the way universities are supported or financed which might enable us to keep people in those subjects for longer than currently they are allowed to remain.

Lord Sainsbury of Turville: I am not quite certain of what the question is here. There is nothing which discriminates against women in this context. The issue is about women particularly coming back into science after having taken time off. I do not think otherwise there is anything which discriminates in terms of the conditions they have from men in any way in this.

Q40 Mr McWalter: Women take time off; men do not. Maybe we should have paternity leave on the same basis, so as to level the playing field.

Lord Sainsbury of Turville: This is what the returner schemes are about: making it easier for women to come back, because I think there is this very clear problem, which is that if you go off to have a family, science is moving very quickly, it is more difficult to come back. That is why returner schemes, I think, are very important.

Q41 Bob Spink: There seems to be a trend for research to be concentrated in an increasingly fewer number of top universities. Do you think this is a good thing or a bad thing or are you relaxed about it?

Lord Sainsbury of Turville: As far as Government policy is concerned, we are concerned with making certain we maintain the excellence of the research which is being done. That is the consideration. We have no policy to increase the concentration but I think it is true that if you look over the last 20 years you will see that if you take the top 20 universities they are getting a higher proportion of the total research money than they did in the past. That is the aggregation of hundreds of decisions being made about particular research projects being done by their peers.

Q42 Bob Spink: I am sure you would accept that we are dealing with large sums of public money and excellence of research is a good outcome but it is not the only outcome. University research centres that are vibrant and thriving actually generate business activity around them and if this can happen in the various regions it will benefit those regions and benefit the country economically generally. Do you not think that is a target worth pursuing as well?

Lord Sainsbury of Turville: I think it is important that we do have a spread of good universities, research-intensive universities around the country, but as a whole we do have that. We do have excellent research universities, I think, in all regions, even if there is a concentration in Oxford, Cambridge and London of our world-class universities. If you look at this on an international basis, it is interesting, when surveys are done of world-class universities, the extent to which in fact the UK tends to come out rather well now. There was one recently where only four or five universities in Europe were considered to be world-class research universities: one was in Sweden and the rest were in the UK. That is also very important in terms of economic development but I do not think the assumption that there are not world-class research universities in any regions would hold up.

Q43 Bob Spink: It seems you are indicating that this has happened because the Government wants it to happen, building just a few centres of excellence, rather than because the Research Councils have simply directed increasingly their money that way and you have passively allowed this to happen. Do you incentivise the Research Councils to spread their money evenly so that the regions can have good universities and therefore good economic environments, or do you just leave the Research Councils to get on with it and not interfere with their funding decisions?

Lord Sainsbury of Turville: No, I hope I made it very clear that the Research Councils fund projects strictly on the basis of quality of research on a peer review basis. That is the only criterion which they use. On the basis of that, we do have a quite a good spread of world-class universities around the country. If we wanted to—and this is a debate that

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has been had, that one wants to strengthen the science in particular regions—then the right way to do that is through the funds which the RDAs get and that should be tensioned against other use of those funds for industrial development.

Q44 Bob Spink: My experience of my RDA, the East of England Development Agency, is that it knows very little about science and technology and research and is not really engaged with that at all. Do you think the RDAs are equipped and have competence to understand research and to foster centres of excellence of research in regions?

Lord Sainsbury of Turville: There is a question of competence in this. That is why we have been very much encouraging them to have Science and Industry Councils which bring together senior vice-chancellors and industrialists within regions. That is proving, as a whole, very successful. I should say that all RDAs have now agreed that they will have Science and Industry Councils. There may still be a need to increase the competence of RDAs further and that is something we are looking at.

Q45 Bob Spink: The Science and Technology Policy Research did a report and concluded, “In terms of research productivity or output per unit input, there seems to be no evidence that larger departments or larger units are more ‘efficient’ in their use of resources” and they go on to say, “perhaps even the reverse.” This would indicate that perhaps the Government should be more pro-active in spreading the research funds around the regions just a little more and stopping this concentration on the Oxford, Cambridge, London universities. How would you respond to that?

Lord Sainsbury of Turville: I think I would trust the judgment of the people making the allocations through the Research Councils about the project funding. As I say, that is the most important criteria. If that leads to more money going into world-class universities, that is fine; if it goes more to world-class departments in other universities, I think that is also right. But I think if we start moving away from assessing the projects on the basis of the quality on a peer review basis, we would actually be giving up one of the great strengths of the British system, which I would have to say I think has been increasingly admired across the world as being the way forward. This is seen in other countries to be increasingly a strength that the UK has, as with America, that the majority of the funding in this area is done on a peer review basis and purely on the grounds of excellence.

Bob Spink: I congratulate you on consistency, because that is exactly the answer you gave us in 2003 when you spoke to us about this, when you said basically that you were resigned to the fact that it is left to the Research Councils, and this is what happens when you leave it to the Research Councils with that criteria. I hope that you will go away and perhaps next year when you come in front of us you will have rethought and perhaps you will have a slight nuance on the strategy to give more focus on

some of the regions for the economic development criteria as well as the excellence in research. Thank you very much indeed.

Q46 Chairman: I wonder if I could just add to that. I do not know who replied to our OST analysis, but you or somebody said it was a “caricature of Government policy”. But this was a serious academic study we were picking up that did not provide support for your policies. Is that how you handle evidence in the OST: a “caricature of Government policy”. It was a SPRU argument that we took up in critique of how your department handle these issues.

Lord Sainsbury of Turville: I think it is wrong to say that we are saying we want to see the research concentrated in particular universities. I was saying that we want to see the continuation of the projects being decided on the criteria of scientific excellence. That does not mean you cannot have other money which is done on a different basis, particularly if you wanted to support industrial development. I think one of the encouraging things is that the RDAs, in particular RDAs in the northwest and the northeast, are in fact putting quite substantial sums of money into the science base, and that is increasingly happening with other RDAs, and that has been done on the basis of strengthening science within the region for purposes of industrial development. Obviously the criteria you use for that money is a different one and I think that is greatly to be encouraged.

Chairman: But it is not a question of size of department.

Q47 Mr Key: What are you doing to maintain the skill base in nuclear technology, particularly looking at fusion? When we went to Culham we were very concerned about this. I wonder if, in answering question 5 about the target of 10% renewable energy generation by 2010, you could put a PS about your future policy on nuclear.

Lord Sainsbury of Turville: Yes. In terms of question 5 it is my colleague Stephen Timms who deals with the question of that achievement of that target. What is clear is that target is now getting a near-term target. Given the time it takes to take projects through the planning process, build them and so on, the research we are doing, which comes under my responsibility in the Research Council, is really not going to make any difference to the achievement of the 10% target. That 10% target will depend on the speed particularly with which we can bring through projects on off-shore wind through to completion. It will not depend on new research but we do have a major programme of research and that includes of course fusion. That of course is on a completely different time scale. If we are talking about 25/35 years to get commercial electricity from that, that is probably the fastest we go. On the other hand, the prize is very great, and we think, having reviewed this very carefully, that this is a huge prize to go for. Of course it is now all turning on the question of deciding on where ITER goes, and that is at the moment deadlocked between the two sides, the

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Japanese side and the French side. We need, first of all, to resolve that issue because that has huge implications for the funding of fusion research in Europe. There is no question, however, that Culham and JET could continue to play a major role in work in this area which would be very important for the design of ITER. This is an issue on which we are working at the moment, but of course it is critically dependent on what happens on ITER and European funding for EURATOM.

Q48 Dr Turner: I am well aware that there is a separate energy minister who has the prime responsibility for a 10% renewables target which nobody I ever speak to believes will be fulfilled, even with wind power—and, indeed, wind power is not the only option. You yourself have a considerable contribution to make and could even make a large one. Could you tell us about your role in energy?

Lord Sainsbury of Turville: My role in energy is clearly to do with the work of the Research Councils and that is mainly about making sure we are doing enough research on the long-term possibilities. Also, we are committed to keeping open the nuclear option, and that means we must continue to do both work on research and on the skills base to make certain that in talking about keeping the nuclear option open we are doing the things which are required to do that. There is some room for debate as to how much we need to do, but that is where I think my responsibilities come in. On the target for the renewables, the important thing is to look at the figures: what we have at the moment, what is in the pipeline, what could be coming into the pipeline on offshore wind. If you look at those you can, I think, see we have a long way to go but it is not at all clear that it is impossible. It could be possible; it depends on the speed in which you can bring certain projects through—particularly offshore wind.

Q49 Dr Turner: What is the progress on the UK Energy Research Centre? Are you worried about delays?

Lord Sainsbury of Turville: This is the UK Energy Research Centre rather than the nuclear one.

Q50 Dr Turner: Yes.

Lord Sainsbury of Turville: I think it is disappointing. I would have liked to have got this through quicker but we have now appointed a person who will be putting together both the research programme and the organisation, so it is now underway, but I have to say I would have liked to have seen it done quicker.

Q51 Dr Turner: Has the location been settled?

Lord Sainsbury of Turville: It is going to be a virtual centre. We will bring in other centres. The reason for the delay is that we have had a number of proposals put forward and none of them were as good as we wanted. We are now putting together bits from the different proposals to create a proper centre. But that is taking longer than we should have taken, I think.

Q52 Dr Turner: I hear lots of complaints from people working in the renewable energy field that the system of government grants for energy research and development or demonstration is very complex, takes a very long time and there is not that much money at the end of it. Do you have any plans for improving and simplifying the system?

Lord Sainsbury of Turville: I do not think we do have any plans at the moment. If people feel there are ways these could be simplified, then we are always happy to look at points that people have. If it comes to: They want more money, that is a far more complicated question.

Q53 Dr Harris: Subject to parliamentary time, is there going to be new legislation to protect people, including from home visits, who work with animals in research?

Lord Sainsbury of Turville: Yes, is the answer to that. The extent of it is still to be decided on. As you know, the industry has put forward proposals for a major new piece of legislation. Of course, if we have a major new piece of legislation, that would take longer to put in and I think there is an issue as to whether we need to pick what we think are the key issues and go forward with those rather quicker—

Q54 Dr Harris: What are they?

Lord Sainsbury of Turville:—by attaching them to another bill rather than to wait and have a major piece of legislation.

Q55 Dr Harris: Understood. What are those areas where there will be legislation sooner?

Lord Sainsbury of Turville: There are a couple of areas that are very important. For example, the question of home visits is one that is being looked at.

Q56 Dr Harris: Any others?

Lord Sainsbury of Turville: There are a number of others. We will probably be announcing things fairly soon on that but there are other areas. I think we are not convinced that a totally new piece of legislation, specifically on animal research, would be the right way forward.

Q57 Dr Harris: One of the problems that has been raised with us, indeed in the House, from people who came together who are victims of the problems that we see, is that it is now very difficult for people who contract with people doing lawful research on animals to get insurance. Is there not a role for the Government proactively to help with that rather than to allow people to go out of business or break the law through lack of insurance?

Lord Sainsbury of Turville: I think there is a very big problem here. The problem is to distinguish between what are insurance problems generally and what are insurance problems which relate to animal rights extremists. Because, as we all appreciate, I am sure, there is really quite a large number of companies who have insurance problems which are in no way related to animal rights extremists.

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Q58 Dr Harris: To be specific: a contractor who is not directly involved in animal research but provides services, gets damage to their property on a regular basis, their premiums go up so it is prohibitive, and that means that they have to either choose between getting insurance or working for that supplier. Surely if there was guaranteed insurance, which is a role for Government—we provided banking for HLS eventually—then that would actually solve the problem because the protesters, the extremists, would see no gain in doing it because there would be this underwriting. Is that not a proper role for Government, to protect the research that Government regulates and often funds?

Lord Sainsbury of Turville: As I say, I think there is a real difficulty here about distinguishing what are problems that the companies have because of the difficulties in the market—I mean, there are very substantial difficulties in the market at the moment—and what are due to animal rights extremists. I think I would not be keen on any kind of guarantee which said we will support the insurance claims or underwrite or provide grants for insurance schemes for people in this field. As is known, there have been exceptional circumstances where we have had to help particular companies on particular areas of their business.

Q59 Dr Harris: In a sense, that is disappointing. As I said to you last time, no one doubts your personal commitment, and certainly in Oxford my

constituents do not, but since we last spoke and you said how strongly you supported the re-provision of facilities in Oxford, a supplier to the building contractors has opted out after being targeted by an animal rights extremist group. I am just worried—Do you share my worry?—that in six months time you will still be taking the view that the Government does nothing proactively and we will have a lost facility or significant extra costs having to be borne by the university because of these problems. Does the Government have plan A before relying on crisis management problem, plan B?

Lord Sainsbury of Turville: Let me make it clear, I regard the situation at Oxford as a place where we have to be quite clear that this research centre has to go ahead. There cannot be any question of this being stopped. That is absolutely clear and a clear commitment in Government. In line with that, Caroline Flint in the Home Office and I are very regularly in touch with that situation, and we will make certain that we give all the help we possibly can to those companies.

Q60 Chairman: Thank you very much, Minister. Time is up, as they say. We will be seeing you in a PAW session on 14 July, reshuffles and events pending, but we note that you intend to be there in the shuffle.

Lord Sainsbury of Turville: I am always delighted to be hauled before you at any time.

Chairman: “Hauled” is the word. Thank you very much.

Wednesday 14 July 2004

Members present:

Dr Ian Gibson, in the Chair

Dr Evan Harris
Kate Hoey
Mr Robert Key

Mr Tony McWalter
Bob Spink

Witness: **Lord Sainsbury of Turville**, a Member of the House of Lords, Parliamentary Under-Secretary of State for Science and Innovation, Department of Trade and Industry, examined.

Q61 Chairman: Thank you very much for coming. We are having a session or two this week. This is a half hour session which we are very grateful for. Could we start off by asking you: what is really new with this Investment Framework that we have not heard before that was not going to happen anyway? Excite me.

Lord Sainsbury of Turville: I think the very fundamental thing is we have set a very clear target for what we want to do over the next ten years, which I think is a very ambitious target. As you know, there is a strong disinclination, usually, to set targets for what we should be trying to achieve in terms of many things, but particularly science spending over ten years. The fact we have put down a very clear target for where we want to be, we have calculated what rate of growth we have to get to get to that and that this settlement is in line with that. It does not have, clearly, a commitment necessarily to follow through all that, but there is a clear steer that that is what we should be doing. I think that shows how committed the Government is.

Q62 Chairman: Specifically, what is new in it all that was not there before, other than you have laid it down in hard and fast black and white now perhaps? All those things were there before, the ideas of looking at this and looking at that, and so on, and science and all that?

Lord Sainsbury of Turville: There is one major chunk of it which is new, which is all the stuff on teachers, giving a very clear steer to the fact that we are going to take action to make sure that we do have a proper supply of teachers. That was probably one of the things of most concern to the scientific community. I think what we have been saying on science in society is much clearer the way forward on that. That, I think, is different. Then in other parts of it what we are making clear is how the money that we have allocated under the Spending Review is going to be used in achieving our objectives.

Q63 Chairman: That does not sound very new to me. I have heard all these things before. You are talking about Horizon Scanning centres now. That is new. That is really a different phase. It is Foresight in a new clause is it not? The Foresight programme was the great white hope, I seem to remember, compliant recently and now it is re-emerging as this Horizon Scanning centre. Is that not the case?

Lord Sainsbury of Turville: No. I think there are different ways of doing these things. The Foresight programme was very much about taking major areas of almost the whole economy and looking at what was going to happen in these. I think this is very much it may be what Foresight was originally intended to be, which is technological forecasting in the different areas which can then feed into things like the technology strategy, the coordination of science across Government and, indeed, also work of Research Councils.

Q64 Chairman: How is private industry going to help in all that kind of thing? What is new there then? How are you going to induce and seduce them to play a major part in that?

Lord Sainsbury of Turville: In the Horizon Scanning?

Q65 Chairman: Yes, the interaction.

Lord Sainsbury of Turville: I guess the other thing which is very substantially new in the sense of, we are putting sums of money into it, is the technology strategy. This ten-year investment strategy is not only about funding of basic research. It is also about how we transform that knowledge into wealth creation and jobs. The main focus of that is the technology strategy. Of course, the whole point of that is: we will be working very closely with industry as to where are the areas which we can get competitive advantage from that.

Q66 Chairman: So you would like to share all that information with industry?

Lord Sainsbury of Turville: It is more than sharing it. We want to get a lot of it from industry.

Q67 Chairman: They control it?

Lord Sainsbury of Turville: No. We have already done some very good work I think with the aerospace industry in which we have been talking through with them and getting them to assemble the case for the areas of technological development which would really be important to them in terms of competitive advantage in the future. It is on these areas that we want to work with industry.

Q68 Dr Harris: You mentioned in your response to the Chairman's first question the importance of teaching and increasing science teacher capacity. Do

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you think a good starting point is to accept that seven years into your administration there has been a failure to tackle this problem so far?

Lord Sainsbury of Turville: No. I think, in fact, it has been moving in the right direction in terms of additional recruitment of science teachers, but I do not think it is nearly fast enough. I think we are becoming increasingly aware that it is not just a pure numbers game; it relates very much to the qualifications of the teachers. The thing that worries me most is that we have so many people teaching physics at the 14 to 16 age group who not only may not have a physics degree, but also may not have physics A level.

Q69 Dr Harris: We understand that problem and, clearly, Government does, based on what is here. It is very welcome that you mention that you are going to do research now to find out why people are leaving; that is an extremely welcome recognition that we need to know the answer to. Do you think if you had those answers already we would not be in the situation where, every couple of years, the training bursar in the golden hellos have bumped up another 1,000 in what appears to be a desperate attempt chasing the tale of what the private sector can offer to retain and keep these teachers? Do you think we should have had that research earlier in order to inform policy?

Lord Sainsbury of Turville: I think always in these situations you would have liked to have done everything to get things right on day one of becoming the Government, but that is not how it works. It is not always immediately clear where the major problems are. I think we have already made some progress in terms of getting the number of new teachers up, but I think this issue about quality has come to the fore, which we were not aware of and there was no evidence about, particularly.

Q70 Dr Harris: My final question is: what about retaining the science graduates? Is there any mechanism where you can measure whether by measuring the number of tenure posts, the proportion of tenure posts, whether the aims we all want to see, which is an end to short-term contracts, is moving in the right direction? I cannot see much in here that will show how that can be helped by Government policy in this framework.

Lord Sainsbury of Turville: I think there is very little in here, except probably the major issue. The major issue I have always thought why we had a problem on short-term contracts was that the fact there was great instability on the flow of money to universities. In that context, vice chancellors wanted, above all else, to keep flexibility. That is why they put people on short-term contracts. The fact that we are now giving proper long-term funding to universities and the very welcome feature of this particular settlement, which is that we have quite substantially additional money coming from HEFCE, in fact 6% per annum in real terms, means that gives considerable room for manoeuvring for vice chancellors and the scope to make more people in permanent posts.

Q71 Dr Harris: We hope.

Lord Sainsbury of Turville: Yes. Unless you think the Vice Chancellors are particularly vicious people or who want to keep everyone on short-term contracts, the fact they have long-term funding I think makes it likely that they will do so.

Dr Harris: We hope.

Q72 Kate Hoey: Following on from the education part, how much, as Minister of Science, are you involved in the numbers of schools that are becoming specialist science and technology schools? Is your Department getting involved with any of that? Any monitoring, any looking, any checking, any setting targets?

Lord Sainsbury of Turville: No. We take an interest in it, and I have the figures, but it is not something that I can particularly affect because it is about particular sources of money which obviously come from the DFES.

Q73 Chairman: You have not even asked about the frequency of engineering schools as against other type of schools? Is that not a surprise when you are controlling science teaching in this country?

Lord Sainsbury of Turville: It is driven by the schools coming forward with proposals to which Government matches funds.

Q74 Chairman: Yes, but they do it in a coordinated way. I know in Norwich if you have one type of school, a sports school. A mixed school does not ask for a sports school, they go for something else, arts or something. They are not daft. They know that their chances are increased if they do something different.

Lord Sainsbury of Turville: No. I have to say I interpret my job as Science Minister extremely widely, but I do think that the actual running of schools is really—

Kate Hoey: I think there should be a bit of joined-up Government on that.

Q75 Mr McWalter: I am pleased that it has been very successful, Lord Sainsbury, on the matter of resources and the profile you have given to science, but I do feel grumpy about how you interpret your job. I do not think you interpret it widely enough. For instance, there is a catastrophic decline in incomes by Further Education lecturers. As a result, it is uniquely awful for people to think about teaching maths or science in the FE sector. Constantly, when we raise these issues, it is like it is an SEP. It is somebody else's problem all the time. Is there a way in which we can get some serious, and take Kate Hoey's question, some serious joined-up Government so that whenever we raise a problem about science why are we not giving incentives for undergraduates to study science? Why are we not doing something about science FE teachers, et cetera, instead of it being always somebody else's problem? There is a Science Ministry which says: that is a real problem and we are going to tackle it and coordinate that problem across Government.

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Lord Sainsbury of Turville: There is a question of who is responsible for which bits of it. In this case, what I have just told you is how we are radically changing the position on science teachers.

Q76 Mr McWalter: For those you need science undergraduates. The Department of Education is very clear that it really wants to have top-up fees and all the rest of the paraphernalia. As a result, Vice Chancellors are not just people, they are not. They know an expensive thing when they see one. An engineering department or a chemistry department is an expensive thing. There are not very many students coming forward and they are not going to keep their departments open, let alone open new ones. In the meantime, we all know this is the problem, you know this is the problem, that somehow or other the problem is disseminated amongst so many governmental departments nothing ever gets done.

Lord Sainsbury of Turville: Hang on a moment. That is one of the things which is tackled in the ten-year investment strategy, which again is new.

Q77 Mr McWalter: FE lecturers are tackled?

Lord Sainsbury of Turville: No, no. The question of departments of physics and chemistry: there is a quite clear commitment here that in this case, because we have taken it along as a problem to DfES and HEFCE, and it is agreed that money will be put aside for what are the departments which are considered to be key to national interest in this to make certain that we do not find ourselves where there are particular regions or other areas where there is a lack of these particular departments. They will make funds available to deal with that. That is very specifically dealt with. It is quite new. It is quite a radical change because we are saying we are not just letting the forces work on a totally decentralised basis. If there is a national interest here, more money will be put to it. That has been specifically dealt with.

Q78 Chairman: Large-scale European facilities which will not necessary be based in the UK.

Lord Sainsbury of Turville: Yes.

Q79 Chairman: How do you decide to support them? What criteria do you use to give them support, I think the ITER project, which is stalled at the minute.

Lord Sainsbury of Turville: One of the innovations we have had, of course, is the large facilities road map going forward for 15 years. One of the reasons for doing this is that this does enable us to plan forward for facilities as opposed to what we had before, which is just every so often someone says, "We ought to do something", and then produced a plan for something and there were no priorities set in this process. We now set very clear priorities. The objective, which I see as being the objective or the target I should meet, is to make available to British scientists world class facilities in all the key areas, not necessarily in the UK, but that they should have access to them. To do that in a sensible way means that we have to do a few of them ourselves and make

use of other facilities from other countries for other parts of it. In a sense, there is a kind of trading relationship, which is: we will do some, we will make use of other people, and the ones we do we will let other people use to some extent. I think the second criterion of that is, of course, that you will do the facilities in the areas where we have particular strengths or where there is a particular national need for it. In the first case, the fact we are very good at neutron sources means that this is something where we will probably play a leading role and certainly are looking at that. The diamond synchrotron is a case where I think there is a wider need than just our scientists using it which relates to various industries which will use this, like the pharmaceutical industry.

Q80 Chairman: That could be the last one in the UK, given that we are competing against the US and Japan now for particular facilities. The European dimension has always considered you are European, not a little Englander. That is the way forward, is it not?

Lord Sainsbury of Turville: I think there are different sizes of project. There are projects where you might have three across Europe. There will be a number, probably too many synchrotrons across Europe in the end. There are projects which are European projects and of course there are world projects. CERN and the new linear collider will be world projects, ITER is another one. Then there are some which are European projects, like the Europe neutron source.

Q81 Bob Spink: Could I take you, Lord Sainsbury, to the European Research Council proposal?

Lord Sainsbury of Turville: Yes.

Q82 Bob Spink: What role is the UK playing in its negotiations, and are you positive about this potential move?

Lord Sainsbury of Turville: Yes, I think we are very positive. I think the reason for this is that there is perhaps a fairly sort of key strategic issue here, which is I do not think it is clear that bringing together basic research and industry-driven research, competitive research together in the same Framework is necessarily the best way to handle research. The reason for that is: when you are doing basic research I think you want to do it on a system which is basically run by scientists on peer review, the criteria is excellence of the research. When you are doing industrially-oriented research then you have a different way of managing it and different criteria. You want that very much to be driven by industry. One of the things we are seeing, which is I think very disturbing, is that the rate of industry participation and Framework programmes has been going down. That is not simply a UK problem, it is a European problem. I think one of the advantages of European Research Council they will say this is the basic research. We will run that through an agency, peer review, criteria of excellence. That means that the rest of research can be very clearly focused on industrial needs, so we are supporting that.

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Q83 Bob Spink: That is very clear, thank you. Do you think in the future there should be a merger of the European Science Foundation with the ERC?

Lord Sainsbury of Turville: I think we are not in the stage of anyone negotiating anything at this point. There are still final decisions to be taken about a European Research Council. The important thing is to be very clear about what the requirements are for a European Research Council and then see whether the European Research Foundation meets that in any way, the Science Foundation meets that. I have to say that on a first look it seems very unlikely. One wants the research agency to be very firmly run by excellent scientists, not on a trained association's view, which is the European Research Foundation.

Q84 Bob Spink: Do you think the ERC should meet the full economic cost of any research that it supports?

Lord Sainsbury of Turville: Yes.

Q85 Chairman: Good answer.

Lord Sainsbury of Turville: Whether we get that is, of course, speculation.

Q86 Bob Spink: Would that be a condition of UK support for the ERC?

Lord Sainsbury of Turville: I think the point is to be clear on what basis it is and then say do we want to support it. We would clearly be arguing for the fact it would give full economic cost.

Q87 Bob Spink: Looking at the funding of an ERC, if it comes forward, do you think that this should be funded from the existing cake by taking a bigger proportion of funds from that cake or do you think it should have new money fed into it?

Lord Sainsbury of Turville: I think it can work at both levels. If one said we will split the Framework programme into two and have a Research Council and a set of industrial programmes, I think that probably would be a step forward anyway. I think there will be a strong move to put more funds into the research, into Framework or research programmes. The Commission is already arguing for a very substantial increase. We would be joining them in that, subject to keeping within the overall budget constraints.

Q88 Bob Spink: You have been very helpful. Just one short final one. If in future the full economic cost of research was not met by the ERC would the Government put matching funds up to top up for particular researches?

Lord Sainsbury of Turville: I think that is the way that this whole thing is moving. The whole question of what is the purpose for QR funding. One of the purposes is quite clearly to cover those areas where there is not full economic cost, whether it is charities or European money, as well as giving the discretion to the Vice Chancellor to do particular Blue Skies research.

Q89 Mr Key: Minister, have you ever had a discussion about his concerns about science with the Prince of Wales?

Lord Sainsbury of Turville: No.

Q90 Mr Key: Do you not think that is a pity? He is not wrong. He is merely reflecting the feeling of most people that science is deeply boring and rather dangerous. In fact, everything we have been saying this afternoon to the average punter on the street, or in our constituency, would appear to be astonishingly boring. I know it is very worthy and very important but I see that you are doubling the budget on science in society to £9 million a year. That is tremendous, but it is not going to fire people up, is it?

Lord Sainsbury of Turville: I think you do an injustice to the British people. The British people as a whole are rather interested in science and excited about it. What they have is concerns about particularly new technologies; that has always been the case. I think the two areas you need to act on. One is: inspiring young people. That is a lot to do with very good teaching. The second is to deal with this issue, the science in society issues. I think that has more to do with dealing with people's anxieties about new technology and providing the fora in which these issues can be debated, particularly debating them upstream, the ethical, the environmental, the health, the safety issues, before a new technology comes in. That is why we have asked for this work to be done by the Royal Society and the Royal Academy of Engineering, which I think even the Prince of Wales approves of.

Q91 Mr Key: I am sure he does, Minister. Why is it that Friends of the Earth and Greenpeace and Plant Life International and The Eden Project get all the Brownie points and they do a great job, but all the worthy scientists, and the Government is spending all this tax payers money, it does not get a look in. Of course, what you are doing is excellent. How are we going to capture the imagination of the British people? I do not think they are really very interested in science. They are interested in not thinking about science and saying no to all sorts of things. How are you going to achieve this? What do you mean, for example, by responding to public concerns?

Lord Sainsbury of Turville: I think, if I may say so, on the first point the evidence would suggest that you are not correct. If you look at the survey data, a very large number of people say they are both excited and amazed by the discovery of science. By and large they think that helps take things forward. I think you have only to look at the response you get to all sorts of areas of science to know that people are excited about it. That is the first issue. As I said, the main issue, the problem is that people are concerned about the new areas of technology. I think the way that you deal with that is not the old-fashioned way, which was to say, "We must raise the level of education of everyone in science", and if they then have their education level raised in science they will then automatically say: go ahead, do more science because now we understand it. That is not how

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people's concerns are formulated. What they want to know is that scientists have thought about these issues; not when it hits the public, but well before that. That issues of regulation and control are thought through and that is what we are doing, what we have done very successfully in stem cell research and has been done very successfully on the genetic front by Helena Kennedy's Human Genetics Commission and one or two other areas which we should now look at.

Q92 Mr Key: Monsanto thought they were educating the public, did they not, on GM and I think the Prime Minister thought he was educating the public. It did not really work. The Framework says that your new grant scheme will: "Encourage informed media coverage of science". How do you plan to achieve that?

Lord Sainsbury of Turville: I think this is exactly the right issue. I think Monsanto's campaign on that was exactly an example of how not to do it. The reason for that was they had not thought through and they had not gone through these issues of safety, environment and regulation before the products were produced. If you have done that so that when concerns are raised you can say: "No, we have thought about these issues, we have done the research, we have looked at whether there is a problem with nano particles". Then I think, and if that is done in an open and transparent way, that is extremely good in terms of informing the public. They are probably extremely interested to hear it and if it is a convincing case will be reassured.

Q93 Mr Key: Do you think the Office of Science and Technology should set up a rebuttal unit to put things right instantly when there is poor reporting in the media?

Chairman: Peter Mandelson would love to run it.

Lord Sainsbury of Turville: Given the cut-backs of staff, the number of people we would have to employ doing rebuttal I think it is probably rather difficult. In my experience, newspapers print rather few of the letters rebutting things on that basis.

Q94 Mr Key: But a rebuttal unit in the media is very important, like the Royal Institution's Media Centre which has been a huge success. Seriously, I do wonder if it would be helpful to the public in any case when, for example, there is an inaccurate report on radio and television if immediately someone should phone up the producer or someone and you should get an authoritative response. Frankly, the media gets away with an awful lot of murder, does it not?

Lord Sainsbury of Turville: I have always been a very enthusiastic supporter of the Science Media Centre of the Royal Institution. It always seemed to me that it was absolutely essential that that was outside Government and not inside Government because if you have that kind of unit within governments, it does not, I am afraid to say, give other people's views about scientists in government necessarily to help. It is very important it is outside.

Q95 Kate Hoey: Lord Sainsbury, can I just ask: have you been asked to get rid of or to find a way of getting rid of some of your staff as a result of the Chancellor's announcement or does that not affect your particular section?

Lord Sainsbury of Turville: It will undoubtedly affect all parts of the DTI, including my own, yes.

Q96 Kate Hoey: How many people work in your section at the moment?

Lord Sainsbury of Turville: It is about 264 in the Innovation Group and I think it is about 112, 120 in the Office of Science and Technology.

Q97 Kate Hoey: You are expecting to have some redundancies?

Lord Sainsbury of Turville: Yes, I mean, I think—

Chairman: Is that a list that has just come in?

Q98 Kate Hoey: You do not have to name names.

Lord Sainsbury of Turville: I think there should be, yes, and I think it is very important we do this and we do it effectively.

Q99 Kate Hoey: Do you know what areas? Are you going to make the decisions about which areas are suddenly no longer needed or ones that you feel are no longer important?

Lord Sainsbury of Turville: I am not certain it is necessarily a question of saying the right areas which we will not do. The question is: can we do them more effectively and with fewer people? I think there probably is some considerable scope to do things with probably a higher calibre of people but fewer of them.

Q100 Kate Hoey: You will keep all the people with the very expensive salaries and the top names and the trendy titles and get rid of some of the poorer people at the bottom who are doing most of the real work?

Lord Sainsbury of Turville: No. I have never subscribed to the view that there are particular layers of management which do work and the others do not. I think all levels do it. The question is whether we get sometimes the balance wrong between: when we want high level policy work to be done we do it with too many people not of a high enough calibre. That can be a real issue in government.

Q101 Chairman: We will ask the Secretary of State in the next section for more details, so stay around.

Lord Sainsbury of Turville: I would be very interested to. We have had a discussion on this issue.

Q102 Mr McWalter: I wanted to talk about your Monsanto remark, Lord Sainsbury. It seems to me that was itself a uniquely unattractive aspect of the science community because if our constituents come to us and they have a problem with a government's policy, very often those constituents can themselves make a very positive contribution towards the evolution of a better policy. Instead of that evolutionary and learning approach to have, if you like, a discursive approach, to have instead a rebuttal unit or something that says: well, when

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somebody comes up with an objection, oh, we have thought of that already, is exactly the kind of image that makes people think that science is a real turn off. You have to have some way of accommodating reasonable argumentative points in such a way that those making those points feel that people are listening to them. Would you not agree that in a sense you have just indicated yourself one of the reasons why science has such an unattractive image within much of the wider society?

Lord Sainsbury of Turville: As I hope I made clear I do not accept the first point. By and large, people have a rather positive view of science in this country. I totally agree with the rest of what you said. That is why I think it is so important that you get ahead on this, before we get to the situation where people say: "We have a real problem or an issue with nanotechnology". This is extremely important to me. The scientists in an open and transparent way have looked at these issues, have given a lot of thought to it and have done any additional research that needs to be done and we have put in any necessary regulations to cover the areas of ethics, safety, health or environment. It is not a question of saying: we have a rebuttal from that point you made. It is long before it becomes an issue that work has been done and it has been done in a public way so people can see that it is being done properly and if they want to can challenge it scientifically or in other ways.

Q103 Mr McWalter: On a separate issue, many school laboratories are very unpleasant, dank and unwelcoming places. School laboratory technicians are desperately poorly paid and also they work in those circumstances. I accept that there are exceptions. I am speaking in the round. As I have indicated already, Further Education science teachers are currently very poorly paid. What representations have you made to the Secretary of State for Education and Skills about the provision of adequate recourse for science teaching?

Lord Sainsbury of Turville: I have made endless representations and, in the previous two settlements, of course, there was money specifically allocated to improving the quality of laboratories in schools. As I have said, we are doing some things on the science teacher salary. I have made very strong representations because I believe it to be enormously important where we have shortages of teachers in particular areas that they are paid better because in areas like physics, for example, if you are pretty good as a physics teacher you are almost certainly able to get a very good job in industry.

Q104 Mr McWalter: What level of salary have you recommended for, say, school lab technicians?

Lord Sainsbury of Turville: I have to say that I have not made any representation on that. The main focus has been on the question of the teachers themselves. The area where we have done something is in terms of the network of learning centres which will cover both technicians and teachers.

Q105 Mr McWalter: Will you factor in the FE sectors as well as schools because I think that, I am sure you would accept that 10% under the average wage for an FE lecturer is hardly adequate compensation for the work they do, particularly if they are doing work in what we all see as being key areas?

Lord Sainsbury of Turville: Yes. I very much agree with you. I think the FE sector is extremely important in all this because, in fact, the area where we have most problems, in a sense, as a country in terms of skills is not at graduate level it is at the intermediate and technician level. I think there is a lot of work that needs to be done in that area in terms of the teaching qualifications of people, I think a lot of work is being done on that, as well as also the facilities that people have in FE colleges.

Q106 Chairman: Two more questions, Minister. The storm clouds are gathering over North London, the National Institute of Medical Research. You know a task force has looked into the re-siting of that, not at Cambridge any more but in terms of talking to universities in London to do patient-based research. I wonder if you had been part of that decision, the task force recommendation, to ask those two universities in London to come up with a plan to take on the work at the NIMR?

Lord Sainsbury of Turville: No. I think that is for the task force to do reporting to the MRC council and then for them to come up with a recommendation of what they would like to do, which I think will come to me for final agreement. I think it is for them to do the work of looking at that. I think last time it was not done properly, which is why it seemed to me it was important that it should be done again in a proper, open and transparent way with all the options looked at. As far as I know, that is what has been done. In fact, I know it has been done.

Q107 Chairman: Whether it is Kings College or University College it will cost a few million pounds. Will the DTI fund that move?

Lord Sainsbury of Turville: It would be for the funding to come from the MRC to do that.

Q108 Chairman: But you may supplement them if they do not have enough in their coffers?

Lord Sainsbury of Turville: We could do that, but I doubt if that would be a sensible approach to make to us. We do not on the whole hand out large sums of money just because people come and ask for it, as I am sure you are aware.

Q109 Chairman: I understand, yes. Suppose it turns out that neither of them can come up with a viable proposition. Should the NIMR stay where it is and we develop it on that site? After all, it is close enough to London, and internet contact, and so on, can still take place. Because I believe that it has been ruled out as a viable option should those two enterprises fall through with Kings College and University College.

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Lord Sainsbury of Turville: I think that is the reason for having a task force and asking them to do this is for them to come up with what they regard to be the best solution. It is not for me to intervene and say, "You should do this or that". What I am asking them to do is come up with a decision and to do so in a proper and open and transparent way.

Q110 Chairman: You will not consult the task force independently or any members of that task force?

Lord Sainsbury of Turville: No. I think that is for them to do. It would make the whole decision process extremely confusing if the Minister started lobbying or arguing for one particular case with the task force.

Chairman: It does sound like storm clouds are gathering over there from the intelligence we are picking up in terms of how the task force is going about it. We may be into a similar situation as Kings is, so we point that up.

Q111 Dr Harris: You will remember in February Question 56, I was asking about legislation on animal rights extremism and you said that you will probably be announcing things fairly soon on that. Then in May Mr Key and I both asked you about the same thing. You said that there was a meeting and that you would pick out all those things that would be new powers or changing in existing powers to be helpful, we will see what comes out of that and take it forward. Given my constituents in Oxford are in the front line facing animal extremism, I am rather hoping for "shortly" and "soon" to mean something. The report just says: "The Home Office will publish shortly", again there is that word, "a document setting out in full the approach by the Government". Will that document be legislation and will it be soon enough to support the people in Oxford who are on the front line facing unreasonable pressure from animal extremism which the police, I think it is widely accepted, do not yet have the full powers to tackle?

Lord Sainsbury of Turville: Yes. Shortly means within weeks. It can be taken literally rather than the political use of the term. It does mean shortly, it does

mean within weeks. We will set out in that document what we are going to do on the legislative front. There are important things that we will be doing. The absolute primary requirement now is stepping up the police action on this. Within the last few weeks there has been a major stepping up of this. We now have a senior person, whose sole job is to deal with animal rights extremists and coordinating all the actions of both the police and the National Crime Squad and the intelligence services.

Q112 Dr Harris: Will legislation include extending the powers under the 1997 Protection from Harassment Act?

Lord Sainsbury of Turville: That is one of the issues, yes.

Q113 Chairman: I want to finish now by just asking you before I bid you off for a restful summer, how often do you talk to the Prime Minister about these particular issues or do you not talk to him directly about science in general?

Lord Sainsbury of Turville: Not at all, is the answer. That is not to say that he has not shown an interest in it, but I have not had a meeting to discuss these issues.

Q114 Kate Hoey: Would he be an expert on nanotechnology or GM food?

Lord Sainsbury of Turville: I have never talked to him about GM food very specifically and for very obvious reasons. He did, in fact, when the issue came up get Lord May—or Sir Robert May as he was then—to give him a seminar on it and take him through the whole of the technology. He also nowadays knows quite a bit about nanotechnology because we have science seminars for him. I have been present at one of those. There is another one coming up. That covered the subject of nanotechnology as from a technical point of view. Of course, as you know he referred to it in his Royal Society speech.

Chairman: Minister, thank you for answering our questions. Thank you very much for all you have done for science. It is good news and you play a major part in it.

Wednesday 14 July 2004

Members present:

Mr Ian Gibson, in the Chair

Dr Evan Harris
Kate Hoey
Mr Robert Key

Mr Tony McWalter
Bob Spink

Witness: **Rt Hon Patricia Hewitt**, a Member of the House, Secretary of State for Trade and Industry, Department of Trade and Industry, examined.

Q115 Chairman: Thank you very much, Minister, for coming so early after the spending review; it is fresh in our minds and I am sure it is in yours too. We want to probe a little of the thinking behind it. Since some of the Members of the Committee have to dash off to other engagements I have asked them to be very concise in their questions. If you please could be helpful and give the answers, too, in a concise way. Let me ask the first question about the Investment Framework programme which sets the Government the target of achieving an R&D spend of 2.5 GDP by 2014. This is lower than the Barcelona target of 3% by 2010. Why have you taken the later target? What precipitated that? What has driven that?

Ms Hewitt: What we wanted to do, Chairman, was to set a realistic and attainable target. Given the cut in science spending and support for R&D through the eighties and early nineties we were starting from further back than we wanted to be. If you look at the United States, which is well ahead of us in this area, they are at 2.8%. We felt that 2.5% was an appropriate target. It is still stretching, given where we are at the moment, but we believe we can attain it.

Q116 Chairman: To meet that target of 2.5 I think you have to admit that the private sector will have to match Government's commitment. What new measures are you pioneering to take to ensure that the private sector does commit to increased R&D expenditure because it has been a critique of this country for a long time of R&D? What are you doing to precipitate that?

Ms Hewitt: You are absolutely right, Chairman. That 2.5% target, we would be looking at 1.7% of GDP in private R&D and 0.8% in the public sector. On top of the R&D tax credit, which is extremely important in this area and which we have already made more generous and more effective, what we are doing as part of the Science and Innovation Tenure Framework is to invest additional new money in the technology strategy, which is designed to pull businesses into partnership with the science base. By 2007–08 we will be committing at least £178 million to that technology strategy. That money is only available to partnerships that involve businesses and involve businesses that are investing their own funds as well.

Q117 Chairman: You talk about businesses, do you mean small businesses and big business or where are you looking for the growth there?

Ms Hewitt: The technology strategy will provide support for partnerships between the science base and businesses of any size within the priority technology fields that we are identifying, and of course in future will identify through the Technology Strategy Board with industry as part of it. What I think we are seeing, which is very exciting, is more of the small and medium-sized companies, some of them, of course, are spin outs themselves from the universities, who are at the leading edge of exploiting new scientific breakthroughs and new technologies. I would expect quite a lot of the partnerships to be funded through the technology strategy to bringing in and supporting the smaller companies.

Q118 Chairman: In the recent debate on nanotechnology we had in Westminster Hall, following our study into that area, a Minister, one of your staff there said that the Investment Framework proof of concept “. . . funding was no problem”, but the Investment Framework that you are talking about does identify that as a problem. Is there a contradiction there or is it a slip of the tongue, or what?

Ms Patricia Hewitt: I do not know specifically what was being referred to on that occasion, but of course Scottish Enterprise has a specific grant for proof of concept. Indeed, when I was in Edinburgh on Monday helping to launch the biomedical centre at the University of Edinburgh, part of the funding for some very exciting research going on there has come from the proof of concept grant. In England, we have the Grants for R&D which does something similar. In England the R&D Grant, and more broadly the technology strategy that we are now increasing the funding for, will help to bring through the commercialisation, including at that very, very early stage where you are not really going to get bank financing or certainly not going to get capital funds.

Q119 Dr Harris: Your projection for this increased R&D investment as a percentage of GDP does not envisage an increase in R&D funded by other Government departments. Yet R&D funding across Government, excluding the NHS, is lower now than in 1990. Why is that?

Ms Hewitt: We have been looking right across Government at R&D funding to make sure, both that we are getting as much as possible going through, but rather more importantly that we are

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getting the best possible results, the best possible quality from that R&D investment. Sir David King is working with the Chief Scientific Officers of different Government departments to look at their R&D plans. We certainly think that by bringing Government departments together, and using different Government departments' R&D funding on projects and technologies where there is a common interest, we can get much, much more synergy and therefore much more result. As you rightly say, in the NHS area there is a significant increase in the NHS and Department of Health investment in R&D. When you add that to the MRC funding, that represents a very, very major investment, specifically in medical and biomedical research.

Q120 Dr Harris: I do not think anyone would disagree with anything you said in that answer. I am not sure it was a precise answer to the question. I think everyone agrees: better quality research is better than worse quality research. The question was that it looks like total Government R&D outside of the science base, if you like, is not envisaged to rise. Yet you state elsewhere that you want policy making to be underwritten by good quality research and presumably more policy to be underwritten by good quality research. It just concerns me that there is a disjunction between that and the projection for civil R&D expenditure across Government?

Ms Hewitt: What really matters across Government R&D and the issue of underpinning policy making with well-researched evidence is really about the politic of what we are getting for the money rather than the quantity.

Q121 Dr Harris: A lot of projects that are Alpha rated do not get funding, so that cannot be the sum total of your answer. We, as a Science Committee, want to see at least alpha rated projects getting funding and not having a continuation of the absurd situation that major good quality work could be done and is being turned down on funding grounds.

Ms Hewitt: I suspect that there will always be more very good quality work that could be funded than there is funding to support. The important thing is that we are significantly increasing the funding through the research councils. Indeed, in the ten-year strategy and in the spending review proposals that the Chancellor announced on Monday, we are putting in half a billion pounds of new money over the SR period into the science budget. By 2005–06, we will have doubled the science budget in less than a decade.

Q122 Dr Harris: Will your commitment to having evidence based policy making based on the use of research lead to the abandonment of policies if they are not working or shown not to work or the research shows that they are unlikely to work and have unwanted consequences?

Ms Hewitt: I am not going to make a blanket statement on behalf of every possible policy that the Government is delivering, but let me say that—

Q123 Dr Harris: That is what evidence based research means. The implication is that if the evidence suggests it is wrong then it will be abandoned because it is not a one-way street?

Ms Hewitt: Absolutely. What I was going to say was, as a Government, I think we have been second to none in our commitment to evaluation, to assessing the evidence where it exists before we make policy. SureStart is a very good example of that. SureStart was based on a very thorough assessment of the research evidence, both in the United States and from the United Kingdom. We designed the SureStart programme on the basis of that evidence. Since we put the programme in place we have been evaluating and assessing it and the results so far are very good. Conversely, Education Action Zones, which started with high hopes, did not, in most cases did not fulfil those hopes and so we have moved on to something different.

Q124 Dr Harris: I have another example. We asked Colin Blakemore, when he came before us, and he answered us in a personal capacity, whether he was concerned that the policy of producing science graduates with significantly higher levels of debt would encourage them or discourage them to enter into public sector fields and enter into less well paid, relatively speaking, academic research posts. He gave us a clear answer—and I cannot give you the direct quote—that he thought that it was likely that would have that undesired effect when we all know we want more science graduates and more graduates to go into those roles. Is there some research, as yet unseen, unpublished and unknown, that suggests that the outcome of the current proposed policy on increasing graduate debt will, in fact, not have that impact? Have you been able to refute the evidence that has been published to suggest that would be the impact and will make matters in this area worse?

Ms Hewitt: I think in the spirit of scientific inquiry that is a hypothesis that will have to be tested. My understanding is that fears of that kind are not borne out by the experience in Australia. As far as our own situation is concerned, we will need, obviously—and we will do so—to evaluate the impact of repayable tuition fees, but we will need to do so, of course, in that we will also need to look at the impact of the increase that we have just announced in funding for PhDs and for research fellow stipends, which of course do not trigger a repayment of the undergraduate loan. We will also need to take into account the increase that, again, we have just announced in golden hellos and such like to people entering teaching in the shortage subjects, notably science.

Q125 Dr Harris: Would it have been more desirable, given your earlier commitment that you set out for evidence based policy making to have done some attitudinal research in this country, or at least in this hemisphere, perhaps in this continent on the impact of increasing graduate debt on the likelihood of people getting into science careers and staying there,

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particularly women. I think it has been shown that women get into greater debt for longer in these packages.

Ms Hewitt: We start from a position where we do not have anywhere near enough women: girls going into science subjects in schools, women going into science engineering and technology degrees and, indeed, we have a rather large number of women who did get science, engineering or technology degrees but are not working in careers that make use of those skills. These are issues that have been troubling many of us for at least the last 20 years. I think what we are doing, and I am happy to elaborate on this, is taking a number of steps to try and make science, engineering and technology much more attractive generally to young people. On the issue of tuition fees that has been very, very extensively debated. We have thought about it extremely carefully. We went on the basis of the evidence we already have from the policy we had inherited, the policy from the first term. I believe that by abolishing upfront fees, as we are doing, and putting in place far more generous grants for people from low income background, we will improve the position compared with where we are now.

Q126 Dr Harris: I have to go early so the Chairman is kindly allowing me to ask my questions early and I am grateful to him for doing that. In terms of policy across Government, are you happy that in terms of the public understanding of science that Government, including your department and industry is getting it right? We had a discussion earlier with your Science Minister about whether Monsanto's approach to GM in the right way. Do you think the Vodaphones and Oranges of this world did the right thing in order to avoid the scares one hears about irradiation and the potential impact on health?

Ms Hewitt: I think there are a number of lessons for all of us in public life to learn about public understanding of science and how one gets a well-informed and balanced debate around the scientific-based questions. I think probably certainly the best recent example that I am aware of where that has been done really well has been on the issue of stem cell research and the related questions of medical ethics. I think it was better done in that area than perhaps either on GM foods or indeed mobile phones and mobile phone masts. Specifically on the issue of mobile phone masts, when I was a Commerce Minister I was involved obviously in discussions with my Department of Health colleagues in commissioning from the Chief Medical Adviser a review of the evidence, one, on handsets, the other one on mobile phone masts. That has proved an area where many people's belief that they or their children are suffering as a result of proximity to masts has proved pretty immune to the scientific evidence that is available.

Q127 Dr Harris: Are you disappointed that your own party in Birmingham is putting out a leaflet suggesting that it is somehow wrong or unsatisfactory to put up mobile phone masts, even

against residents' wishes, when those concerns are based on ungrounded health fears that you just enunciated? That is a sign that the Government has failed really to get a coalition even within the major parties because I do not think any party is blameless.

Ms Hewitt: I have not seen that leaflet, but what I put in place with the industry when I was a Commerce Minister was an agreement about the need for proper labelling of handsets and the need for proper consultation with local communities about the siting of masts because even though I do not believe that there is a scientific basis for the fears that some people express, I think it is extremely important in a democracy and wise for businesses to be sensitive to public concern and to consult the public and as far as possible reassure them.

Q128 Dr Harris: My final area is about ITER and fusion, given the use of fusion which is something you have been following. Given the UK's expertise in fusion technology, including and especially in Oxfordshire, can you give us an update on how you anticipate UK involvement in the ITER programme to be, although we are awaiting a final decision on where that is going to be posted?

Ms Hewitt: We fully support the European bid to host ITER. I hope we can get the choice of site made during this year. As you say, that has been quite a vexed issue. Of course, Sir David King has been playing a very important role in looking at that whole issue. I do believe that ITER will succeed best as an international partnership. What we have been doing is encouraging all the partners involved in it to find a compromise. I think the best approach for this wider ITER programme might well be to have facilities located both in Japan and in Europe.

Q129 Dr Harris: Is that, what you have just suggested, plan A or plan B, in other words if it does end up in Japan are you saying that you are really keen to see perhaps a materials unit in Europe and you will back that fully even to a greater extent in terms of the funding that has been done already if that is what is required to get that?

Ms Hewitt: I do not think we are at that stage. At this point, what we are trying to do is ensure that there is this genuinely international fusion research programme. I think that is the best approach. That is probably going to require a compromise over the issue of where the site should be. That compromise might well involve putting the facilities both in Japan and in Europe. If the partnership breaks up, there will have to be a different approach. Europe is looking at what the options might be in the event of a partnership breaking up. I do think having two ITERs would be counter-productive.

Q130 Bob Spink: On the subject of ITER, do you have a view, Secretary of State, on the results that we will see from ITER over the next five or ten years in terms of the output to input ratio on energy?

Ms Hewitt: No, I am afraid I do not. I would be very happy to send a note to you but it will be based on much better scientific knowledge than I have in my head.

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Q131 Bob Spink: I was hoping to tempt you into a favourable prediction. Can I take you then on to the quantum of research that is funded by the research councils, the total volume? Do you think that will fall with universities charging the full economic cost of research?

Ms Hewitt: I do not believe that it should do so. This issue of full economic cost recovery was identified by, amongst others, I think this Committee as a very important issue because what was clearly going on in the universities was that they were getting the marginal cost of doing research and then having it impose the rest of the costs on other parts of their funding streams. That was not satisfactory and what we have been doing, both in the current and in the new spending round, is ensuring that the universities can charge full economic cost and really ensuring that they do so in future, whether funding is coming from the research councils or other government departments or the charitable and private sector.

Q132 Bob Spink: At the moment, the dual support system sees the money provided from research council grants and the funding councils. When or if the research council grants are going to meet the full cost, what do you expect the universities to do with the money that they would be receiving from the funding council?

Ms Hewitt: We have made it very clear that we think the dual support system should continue but rather than, as it were, bury a significant part of the real costs of doing the research in funding that they are actually getting for other purposes, notably teaching, we think the costs of doing the research should be covered through research funding, wherever that is coming from, and that will then ensure that the funding they get from the Higher Education Funding Council for teaching can be dedicated to that purpose.

Q133 Bob Spink: Thank you. The research councils have said that they are going to undertake a programme of monitoring, benchmarking and sampling to avoid price inflation. Do they have the skills to do this, to assess the finances of the universities?

Ms Hewitt: I think they do. At the beginning of 1999, the Transparency Review began a pretty detailed process of looking at the universities' costing methodology. This track system, transparent approach to costing, was implemented. The first wave was implemented in 2000–01, and the second wave will be rolled out from January next year at the research project level. I think that will give both the research councils and, above all, the universities a much better handle on the true costs of research, which will then allow them to charge the right price or make the right grant applications when it comes to their partnerships with the charities, or indeed the business community.

Q134 Bob Spink: I am pleased that you think they have got the skills and that the systems are in place to do it, but no doubt you would agree with me that this involves quite a large amount of bureaucracy or

administration effort, and this at a time when you have set a target for a reduction in administrative costs of 10% by the year 2007–08. Do you think this reduction target is compatible with the extra burdens you are placing on the research councils?

Ms Hewitt: I was just about to say “yes”, but I do not accept that term “burden” in there. I think it makes absolute senses from the point of view of trying to run a really effective research institute or department that you actually understand the costs of what you are doing. I think that by putting in a proper costing methodology and charging the right cost for the research projects is wholly compatible with being both more effective and more efficient in the way that the universities run their administration.

Q135 Bob Spink: This is just a slight change of direction, Secretary of State. You have kindly found an extra £90 million to support charitable research. How did you come about that particular sum of £90 million?

Ms Hewitt: We looked at what we thought was needed in order to get the right leverage from the charitable sector and we looked at it of course in the context of all the other demands on the science budget. It was considered in quite some detail by our officials, as well as by Lord Sainsbury and Paul Boateng in the ministerial committee on the 10-year framework.

Q136 Bob Spink: Did the universities have an input to that?

Ms Hewitt: I believe so.

Q137 Bob Spink: Do you think that the 90million will be sufficient to enable universities to support all their charitable research projects?

Ms Hewitt: It would be dangerous for me to say “yes” and then some vice chancellor will pop up and say, “Here is one we cannot afford”, but it is a very significant increase in the context of a very large increase in the science budget generally. I must say that, as I go round the country visiting universities and science parks and so on, I am hugely impressed by the way in which the universities are using the new money that we have been putting in and that the Wellcome Trust has been putting in and the way in which they are leveraging that science research investment for commercial partnerships as well.

Q138 Bob Spink: Your unequivocal praise of the universities tempts me to offer you the opportunity to put the boot in now. Do you think that they should use their other sources of income to help fund research as well as looking for new income from the Government?

Ms Hewitt: My understanding is that that is what a lot of our universities are doing. Some of them—Warwick University springs to mind but it is by no means the only one—are highly entrepreneurial in their ability to bring in significant sums of money for basic science, as well as for much nearer market R&D from the private sector. We welcome that, we

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encourage it, we are putting some money into it, both through the R&D tax credits and the Technology Strategy.

Q139 Chairman: Why have you left EU FP overheads out of the equation because many people do not apply for EU grants because they have got to find the overheads from some sources? Why do it for the charities and not European FP6 or 7 money?

Ms Hewitt: I am not sure I know the answer to that. I suspect it lies in the fact that we are a net contributor to the European Budget, but perhaps I could let you have a note on that.

Chairman: It does inhibit a lot of people from accessing European money. They do well but they could do better.

Q140 Mr McWalter: As a committee, I think we are very encouraged by the Government's general commitment to an increase in resources for science but I think we are somewhat sceptical about the capacity that some of the structures that we have actually to deliver effectively on the extra resources that the Government wants to implement. I would like to ask some questions about the Lambert Review to start with because of course Lambert noted that businesses flourish in proximity to good universities. Obviously he gave universities a central role in looking at economic prosperity. As part of that, the regional development authorities ended up having a huge amount of say about how that money was all to be allocated. Perhaps you can tell me, and they envisage regional clusters of competence in the Lambert Review, how those are evolving.

Ms Hewitt: My perception is that they are evolving extremely well. I referred a moment ago to the visit I paid to Edinburgh on Monday. What we are seeing there is a wonderful collaboration of the University, the medical school, the teaching hospital, the medical research community, Scottish Enterprise, my own department, which are all coming together to fund a new biomedicine centre that will include of course a business park, incubator units and so on, but will make Edinburgh, I believe, one of the world's top ten locations for the future development of biomedicine.

Q141 Mr McWalter: Edinburgh has got some advantage, has it not, because in a sense it is a nation rather than a region.

Ms Hewitt: Let me give you the example, if I may, of Newcastle, Durham and the North-East, often singled out as a region which does not get much scientific research funding. A couple of years ago, I launched in Durham the supercomputer; it is one of the world's largest computers, which they are using to do some quite extraordinary research into the origins of the universe. A few weeks ago, I had the opportunity in Newcastle to launch a partnership of Durham, Newcastle and several other universities with one local company in particular, a fairly new but very fast-growing company, and this is a new centre for bioinformatics, which is combining that supercomputing skill from Durham University with

again world class skills in genomics and proteogenomics to create a bioinformatics centre that will grow a cluster.

Q142 Mr McWalter: I think we know that it can work and indeed historically it has worked in very ways, but we are faced with the fact that in reality quite a large number of science departments all over the country are actually shutting down. Lord Sainsbury told us last November that market forces should decide that. Now, of course, we have the suggestion that perhaps the Higher Education Funding Council will consider making additional funds to keep departments open. Why is there this change of policy? Is this because in fact the regional capacity that is needed for Lambert actually in the end was being lost in certain regions? I hear the success stories. I would like you to tell us about the departmental closures and the consequences.

Ms Hewitt: I would say it is very important not to underestimate the success stories and the institutional base that is being created, particularly with the Regional Development Agencies and things like the North-West Science Council, but we looked very carefully at this problem of science departments closing, generally because of the difficulty of getting enough students, and we have seen that with some of the chemistry departments. We looked at that in the context of this ten-year framework. We want to reverse the decline in the number of people choosing to study those key disciplines. We have put in additional funding particularly on the teaching side. We also want to make sure that where there is research excellence in a department that is not lost because of a paucity of students. So it was that analysis that led us to say that we cannot simply leave this to the universities and to market forces. With HEFCE, we are looking, as I think you know, at a possible 12-months notice period before the closure of any department—and we could make that a condition of grant—and the possibility of providing additional funding for a particular department where its closure would affect regional capability in a subject that is really important for regional and possibly also for national economic development. I think that is a very important part of this strategy.

Q143 Mr McWalter: But the Investment Framework provides no direct incentives for undergraduates to study science at all, so you end up with a situation where you have lots of golden hellos and things like that but there is a continuing shortfall in numbers of people coming forward. Why have you not considered that as a goal for the investment framework?

Ms Hewitt: When we look at the whole issue of fewer young people choosing to pursue science subjects, we have to go right back to what happens in the schools. What we all know is that it is the quality of science and maths teaching that makes a huge difference. If you have good teaching, then the chances are it will get the boys and the girls pursuing the subjects and in many cases going on to pursue the degrees as well. That is why we have put the

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emphasis on recruiting more science teachers, and I am glad to say the number of science teacher vacancies is down and the number of science teacher training recruitments is up, and we have put the emphasis on paying those teachers more in order to attract more of them and keep them there once we get them. The other point I should make is that of course the whole SET programme and the very rapid expansion of the science and engineering ambassadors going into schools and getting graduates into schools as well again is an important part of just opening the eyes of our school students to the incredible excitement of what is going on in modern science and the career opportunities.

Q144 Mr McWalter: Yes, but there are a lot of people who never see anybody from SET. I think you will appreciate that.

Ms Hewitt: That is right. That is why we need to do more.

Q145 Mr McWalter: We have a long way to go on that. Obviously you are very passionate about this. What representations have you made recently to the Secretary of State for Education and Skills about the provision of adequate resources for science teaching, and have you quantified those requests?

Ms Hewitt: Charles Clarke and I meet at least once a month, and have done so for the last two years or however long we have both been in post, in order to ensure that on the skills issue, on this issue, on everything on which we have a common agenda, our departments are working effectively as one.

Q146 Mr McWalter: Have you made suggestions to him about much school laboratory technicians should be paid?

Ms Hewitt: Not specifically, and I do not think it is my personal job to sort out the salary schools within schools, but the general issue of how we improve science teaching, getting more technically-qualified classroom assistants, paying our teachers more and so on, all of that we have discussed, and I have to say I am absolutely delighted with the response of Charles Clarke's department and the announcements particularly that we have made in the Spending Review.

Q147 Mr McWalter: Have you suggested to him that further education science teachers, who actually get 10% less than the average wage in the whole economy, might be paid more?

Ms Hewitt: Indeed, and what we have done is not only increase the value of teacher training bursaries for science graduates, the golden hello which I have referred to, but we are removing the cap on how much science advanced skill teachers can be paid, which means, I understand, that a science teacher on the advanced skills scale can get minimum pay of £40,000 a year and in London that is £45,000

Q148 Mr McWalter: Schools get that but FE colleges do not seem to get any of that action at all, do they? David Sainsbury, who has just talked to us about this, says that is the crucial sector in many

ways. Many of the skills that are needed are actually missing at that level, and that is why I was surprised by your answer about school laboratory technicians because that is a very fundamental part of the whole business of promoting a context in which science can flourish and provide you with the people who, in the end, industry and Lambert needs.

Ms Hewitt: I agree, and of course the lab technicians are important and so are the science specialist higher level teaching assistants, whom we are now training. There is a whole new training programme effectively for a new category of teaching assistants. I was simply making the point that I do not think it is my job to set the salaries for different specific groups.

Q149 Mr McWalter: Expressing concern would be helpful?

Ms Hewitt: Expressing concern about it I have done and will continue to do, and, in the light of this exchange, I will certainly put it on my agenda for my next meeting with Charles Clarke.

Q150 Mr Key: Secretary of State, can we turn to climate change and carbon emissions now? I know you believe that we will achieve our target of reducing CO₂ emissions by 20% by 2010. You have to believe it, but why do other people doubt that we can do this?

Ms Hewitt: I have always said, and we said this in the Energy White Paper last year, that this is tough and a lot of things have to happen if we are going to achieve the intermediate target in 2010. We are also of course looking ahead to 2020 in order that we can achieve the larger target for 2050. My colleagues at Defra are reviewing the climate change programme at the moment. We will publish that later this year. That will enable us to form a judgment as a government as to whether we are on track to deliver that 2010 domestic goal and, if not, what we need to do about it.

Q151 Mr Key: Could I turn to a question of process? Can you confirm what I think is my recollection that if one of the power companies wishes to build new nuclear capacity, which may or may not happen, they do have to have a licence from your Department in order to do that?

Ms Hewitt: We are the licensing authority, yes.

Q152 Mr Key: Absolutely, and therefore any company wishing to do new build must have a nod and a wink from the Government that they are ready to process such an application. We are having cat and mouse here at the moment. Eight days ago the Prime Minister was sitting where you are sitting in this very room and the Chairman and I were interrogating him about this issue. He was very upfront about it and he was saying: yes, we must keep the option open. Then he said, "Well, of course, there is a problem of costs" but his own department, or rather I think it is your department, has said that in 20 years time wind energy could be more expensive than nuclear. Then he said there is the waste problem. Look what Finland has done; it is possible. There is public concern in general, and all

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that is true, but in the end the Government has got to give a signal. I wonder if you could tell me when you think that signal would have to be given if we are to avoid the energy gap that the Prime Minister said we are facing in the medium to long term?

Ms Hewitt: I would refer you back to what we said in the Energy White Paper because we looked at this issue extremely carefully and we spell it out in the White Paper. I do not believe that at this stage we are looking at an energy gap. I believe we are absolutely right at this point to put all the emphasis on energy efficiency and on renewables, but, as we say in the White Paper, we do need to keep the nuclear option open; we will need to come back to the question in the second half of the decade and see whether we are making the progress that we are trying to make on energy efficiency and on renewables. When you look, and we did this in some detail, at the timescale for planning and building a possible new nuclear power station, the thing that leaps out at you is the time taken in the planning process. Sorting out the planning process for all large-scale infrastructure projects, not only a possible new nuclear power station, is absolutely essential, and of course we are doing that. The other point I would make is that no company has come to me and said they want to build a new nuclear power station. That is for a very good economic reason. As we point out in the White Paper, the most important change that we can make in the energy market to achieve our goal of low carbon energy is to put a price on carbon through the European Emissions Trading Scheme. That is what we are doing at the moment. We are working extremely hard with the Commission and with other Member States and with industry generally on that, but we have not yet got that in place.

Q153 Mr Key: Ofgem has, for example, a committee on environmental issues, but excluded from that committee, and it is a green committee, is the nuclear industry, which of course is the greenest of all the generators in terms of nil carbon emission. This is another signal from the Government. We do not have a carbon tax system. We have a slightly more difficult one and so once again the nuclear industry is penalised here. I just wonder if you are boxing a bit clever on this issue and between now and the second half of the decade will that be a good opportunity to educate the public on some of the benefits and to dispel what some of us would say are the myths or some of the fears people have about nuclear power and then that will enable you really to take a good, science-based decision and bring the public with you in the second half of the decade?

Ms Hewitt: You raise the issue of Ofgem's Environment Committee. I am happy to say my own department sits on that but of course Ofgem is an independent statutory body and it is up to them who they have on their Environment Committee. I am sure it is doing very good work. There are also, as I am sure you will readily acknowledge, very big public concerns and very real issues about nuclear waste. Defra are looking at the whole issue of what the best technology and approach is to the storage of nuclear waste at the moment. We ourselves, and we

have completed the passage of the Bill in the Commons yesterday, are putting in place the new Nuclear Decommissioning Authority. There is rather a lot to do on that particular issue, as well as the other steps that I have referred to: the reform of the planning system and also, as we flag up in the White Paper, continuing work on nuclear skills. Even if there is no new nuclear build, and that is an open question, we will continue to need highly skilled nuclear engineers for the decommissioning and waste disposal programme.

Mr Key: Thank you. I think that is probably as far as I will be able to get on that one.

Q154 Chairman: We are into the home stretch. The last question follows on from Lord Sainsbury in the last session we had with him and the Spending Review. He thought that there would be job cuts in the OST as well as in the DTI generally but he did not know how many there would be. Could you put him out of his misery, please? I presume he is safe.

Ms Hewitt: Absolutely, we do not intend to do without our wonderful Science Minister. Let me say on that, Chairman, that obviously we are signed up, as every other government department is, to playing our part in greater efficiencies and in doing more with fewer people, and that will be a difficult process but it is also an essential one, but we will make sure that as we achieve those job cuts and those efficiency savings, we will not have an across-the-board job cut; we will prioritise areas and science and innovation are absolutely the number one priority for the Department of Trade and Industry.

Q155 Chairman: Not for cuts?

Ms Hewitt: No, not for cuts but for ensuring that we keep the right number of staff with the right skills. Job cuts will fall less heavily in the high priority areas and more heavily in the less priority areas.

Q156 Chairman: Is the canteen going to close? I am asking you about the priorities. You seem to have priorities in your head. Which areas are ripe for pruning in your opinion?

Ms Hewitt: I am not at this point going to start laying out a programme on which we are still working and consulting with our departmental trade unions. On the Office of Science and Technology, they currently have 165 staff in post; that is at the moment planned to reduce to 154 by March of next year—in other words, a very modest reduction in their staffing level. Most if not all of that, and I would have to double check, is accounted for by the fact that, for instance, the work on women in science, engineering and technology will in future be carried forward by the new independent centre for women in SET occupations, which means we need very few staff working on that issue within the OST itself. Similarly on the Science in Society Programme, we think that by combining our efforts more effectively with outside organisations, we can deploy people more effectively.

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Q157 Chairman: In the other parts of the DTI have you figures in mind there? You are precise about OST. Are you as precise about other areas?

Ms Hewitt: We have a total commitment of 1,000 job losses in the SR period over DTI headquarters. Again, let me just make the point that innovation within the DTI headquarters as distinct from the Office of Science and Technology is a priority area and will therefore have rather fewer job cuts, although every area will be expected to operate even more efficiently than it is already doing. I think Lord Sainsbury made the point that nobody is immune from being expected to be more efficient. Again, I am not going to go through precise numbers because we are still working on those and we are consulting with our staff.

Q158 Chairman: Are you prepared to say if there will be compulsory redundancies or just what we call natural wastage as a euphemism?

Ms Hewitt: I very much hope that through voluntary early retirement, voluntary redundancy and indeed offering all of our staff opportunities to reduce their working hours voluntarily to suit their own needs and get a better balance between their work and the rest of their life, we will be able to achieve the necessary efficiency savings.

Q159 Chairman: Minister, thank you very much for your frankness and for coming here today. May I personally and on behalf of the Committee congratulate you on the hard work you have put in on science and technology in supporting all the enterprise that has been shown by the Government. Thank you very much.

Ms Hewitt: May I say, Chairman, I am very grateful indeed for the continued support, encouragement and constructive criticism from the Committee. I do think that for the Department of Trade and Industry in future the "I" will stand as much for innovation as it does for industry, and those two things of course are inseparable and intimately linked.

Monday 1 November 2004

Members present:

Dr Ian Gibson, in the Chair

Paul Farrelly
Dr Evan Harris
Dr Brian Iddon

Mr Robert Key
Mr Tony McWalter
Dr Desmond Turner

Witnesses: **Rt Hon Paul Boateng**, a Member of the House, Chief Secretary, HM Treasury, **Dr Kim Howells**, a Member of the House, Minister of State, Department for Education and Skills, and **Lord Sainsbury of Turville**, a Member of the House of Lords, Parliamentary Under-Secretary of State for Science and Innovation, Department of Trade and Industry, examined.

Q160 Chairman: Three Ministers, singing in tune we hope! Thank you very much for coming. It is nice to see some of you again and to welcome someone from the Treasury. I think this is the first time, so welcome. Hopefully we will have short, sharp questions, with short, sharp answers. Thank you very much, Paul. Would you like to say something?

Mr Boateng: Chairman, thank you very much. We very much welcome the opportunity, as three Ministers, to appear before you and your colleagues this afternoon—three Ministers from three departments, whose collaboration is responsible for the production of this document, *Science and Innovation Investment Framework*. That collaboration was overseen by a ministerial committee, which I drew together, together with colleagues from the DfES, Alan Johnson at that time, and from the DTI, David Sainsbury, hence my appearance before you this afternoon. The lead of course for the responsibility of implementation lies with my colleagues from the DTI and the DfES, who answer to a ministerial committee that is chaired by the Secretary of State; but it was felt useful for the purposes of this afternoon's hearing that I should be present, not least to explain why it was that the Treasury took the responsibility it did for co-ordinating delivery in this area, because as the Chancellor himself has made clear, it is very much the view of the Government that the future of the British economy depends on the future of British science. In today's competitive global environment, the nations that will thrive will be those which attract and retain the highest skilled people and the most innovative companies, and which take on board the need to ensure that the national investment in science, technology and innovation is of the highest quality and at a level sufficient for the purpose. Hence it made sense, not least in the context of the overall spending review, for which I have responsibility, for us to take the opportunity that was presented by the spending review to have a longer term view, to co-ordinate the response of government across the departments, and to highlight science and technology above many other spending priorities for the treatment that this document reflects, hence the production of a ten-year framework for building British leadership in science and innovation in order to prepare Britain for the challenges ahead. That is the background, Chairman. My colleagues and I stand ready this

afternoon to assist the Committee in any way we can, and to put on record if we may the significance and importance that we attached to the Committee's own deliberations on this subject in the past, as we drew together this document. It is a document that represents input from a broad cross-section of stakeholders, all of whom gave us a valuable insight and input into the document, and foremost amongst those was of course the work of this Committee.

Q161 Chairman: Thank you very much for that introduction. We will be taking up some of those points. Of course, we welcome the ten-year plan, and we think it is amazingly good and so on, but we want to penetrate it to get some detail and smoke that out. You said that you drew it together and co-ordinated: there is an ugly rumour, of which there are many, that the other ministries or other departments only heard about this from the Treasury late in the day; that the Treasury drove this and made it happen, and that was necessary. Please deflect the question to somebody else if—

Mr Boateng: Let me say at the outset that David Sainsbury needs no driving in the promotion of science, technology and innovation; so the DTI certainly was not driven. The DfES under Charles Clarke and indeed before him under David Blunkett, has always recognised the significance and importance of this area, and investment in it. It is undoubtedly true to say that the Treasury believe it right that we should ensure that we play our part within the context of the spending review, to deliver to this agenda, because we are talking about a framework that delivers a commitment to £1 billion of extra funding for the science base from 2004–05 to 2007–08. That is a 5.8% average annual growth in real terms, alongside an undertaking to increase investment here at least in line with the growth of the economy over the next decade. A commitment of that sort could only properly be given by a process that had the Treasury at its heart.

Lord Sainsbury of Turville: It is not correct to say we heard it at the end. This process started at the beginning of the year when I saw the Chancellor, and he said, "would it be a good idea to have this 10-year investment framework?"

Q162 Chairman: It was his idea for 10 years, was it, not five but 10?

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Lord Sainsbury of Turville: No, his idea was that there should be a 10-year investment framework and that we should work together on this. It seemed to me that that was an extremely good idea, because we need to plan it over that horizon, and it seemed a good way to bring all the arguments together.

Q163 Chairman: In terms of the money that will be allocated—and millions have been suggested—who determines the purse strings? How does that come about? Is it the Treasury that just says, “we are only going to put this money in, so sit down and think what you are going to do with it”; or do other people make suggestions, and you have to find the money within your greater budget?

Mr Boateng: No, the process of the spending review is one in which there are inputs from all the departments in terms of their submissions. Of course, that was supplemented and complemented on this occasion by the work of the ministerial steering group, but also a series of events—seminars and working breakfasts and the like—in which the Secretaries of State, with the Chancellor, myself, David and colleagues, all participated. From that, you have the settlement that was announced in the course of the comprehensive spending review, and the context for that settlement which the framework provides. I and my colleagues are quite happy to share with you the figures there, but I have given you the ball-park figure of £1 billion for the UK science base. You can see within that an increase in the OST science budget—£3.3 billion in 2007–08, in comparison with £2.6 billion in 2004–05; a DFES investment in university research in England of £1.7 billion in 2007–08 compared with £1.3 billion in 2004–05. The most useful guide to the allocations, which you and your advisers will be aware of, is on page 9 of the framework. It is a substantial investment. I referred in my opening remarks to the input of stakeholders, and one of the most important stakeholders is the charitable sector. It is the Wellcome Trust’s expectation, assuming current levels of investment return, to commit at least £1.5 billion in the UK over the coming five years, especially for clinical health research projects and infrastructure. What we have done with this spending review—and you can see that in the context of all those since 1998—is to deliver the largest sustained increase in the science budget for a generation, so it will reach £3 billion in 2007–08, double that of 1997 in cash terms.

Q164 Chairman: Suppose Kim Howells comes to you and says, “I want more science learning centres. We have got a few and we are doing well, but we need more.” Then David Sainsbury says to you, “I want more money for the Aurora Project”; who makes that decision? Who decides the priority, or does it happen by ballot?

Mr Boateng: Fortunately, David Sainsbury and Kim Howells have substantial allocations under this particular spending review, and in the context of this framework; and it will be for them to decide within those allocations how the spending will be delivered. Having said that of course, the Secretaries of State

will take into account the ongoing work of implementation, which Patricia is presiding over with the science and innovation and knowledge economy ministerial group, upon which not just the Treasury but all relevant Government departments are represented; and I have no doubt in their allocations and the sort of decisions and trade-offs they have to make, the Secretaries of State and their ministers of state will be influenced and affected by the ongoing work of implementation.

Lord Sainsbury of Turville: In the previous spending review we had some allocations which were rather specific against particular programmes for the research councils. That was very necessary because we wanted to make clear that we wanted to use the increased funds in certain categories. In this particular spending review, that was not the case at all; there were allocations to the research councils, with no detail about which programmes should be done. That will be done by the Director General of Research Councils in March, when he comes to make allocation between departments.

Q165 Paul Farrelly: I wanted to ask a wide-ranging question, Chair. Recently, I had the daunting task of giving a speech at the British Embassy in German on nano-technology, alongside their Secretary of State. She was a very impressive Secretary of State for Education and Skills. They made it quite clear that they thought it sensible that science was where the money was, which was in higher education funding. David Sainsbury, should you not be hot-desking to Kim Howells in Education, rather than the DTI; and to what extent was the position of science within departments considered as part of this review?

Lord Sainsbury of Turville: As you will know, the history of these things is that science in different parts of the world gets put with different ministries. In this country, originally it was with the Department of Education and Science; it was then moved to the Cabinet Office, and finally it has been put with the DTI. The argument for putting it with education is because it has a lot to do with supporting universities. The argument for putting it in the centre is that science applies to all government departments. The argument for putting it in with the DTI is that it is very related to wealth creation. In different countries, this is changed around on a fairly regular basis, because you can make all three arguments very convincingly. As far as the UK is concerned, it is probably in the right place, because our issue is not to raise so much the quality of the research, which would be a good argument for putting it with education, but to make the linkages with the wealth creation and the innovation going on in the DTI. My job of course, is Minister of Science and Innovation, and I am very comfortable with that because I think that is the main requirement and it is in the right place.

Q166 Paul Farrelly: This government organisation point therefore was not considered as part of this really.

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Lord Sainsbury of Turville: No, because it is working extremely well, and this is probably the right place to put it anyway.

Q167 Dr Turner: Paul, Treasury is not a totally altruistic body; you are presumably looking for some payback from increased investment in terms of generating more economic activity. Can this be taken as implying that you want to see spending directed more towards applied research rather than the basic research in which the country has traditionally excelled? Is there any implication that basic research would suffer by comparison with extra emphasis on applied research?

Mr Boateng: The Treasury's interest and concern is an over-arching interest that we have in the productivity agenda. We have sought in this piece of work, in co-ordination with our colleagues, to make sure that we use the 2004 spending review as a vehicle to take stock of current science policy, to build on what was an increasing level of investment in science in previous spending reviews to which I have referred, and importantly I think to use the power and influence of the Treasury to bring together and extend a range of existing policy initiatives, because we had the Government's science strategy investing in innovation in 2002, the Roberts review on the supply of scientists and engineers, in which I was involved as a financial secretary; the Lambert Review, the DTI innovation report, and the Greenfield Report. All of those needed to be brought together. The Treasury does that. You describe it, Dr Turner as being through a spirit of altruism. That is one way of looking at it, but what we have to do is make sure that all the resource that lies behind that is spent effectively to maximum benefit for UK plc. However, it remains, and should be the case—and we are very clear about that and there is no blurring of the lines here—David and Sir David King are also central to making sure that this remains the case, with Kim and colleagues at the DfES—that decisions on allocations to research councils will be made by the OST, based on submissions from those research councils and the OST's assessment of those. The process has to be science driven. It is nothing if it is not science driven, and the last thing that the Treasury seeks to do is in any way to prejudice or interfere with that drive. Proof of the pudding will be in the eating, and research allocations will demonstrate that very clearly.

Dr Howells: Mr Chairman, at the start of the Science Innovation Framework Report there is a page given over to Pasteur's Quadrant, and it has two axes: consideration of use in quest for fundamental understanding; and then a box which is slightly breaking away, which says there are no such things as applied sciences, only applications of science. This is by Louis Pasteur.

Q168 Chairman: He is dead.

Dr Howells: I am aware of that!

Mr Boateng: But whose legacy lives on!

Dr Howells: Whose legacy lives on—and he is quoted in this estimable publication. The point I am making is that it is becoming increasingly difficult to

differentiate between pure research and applied research or the application of science. To strengthen the earlier point, we are extremely interested in knowledge transfer and what that means in terms of where we are going in research. I do not think there is anything to apologise for there.

Q169 Dr Turner: We are not seeking apologies.

Lord Sainsbury of Turville: First of all, I do not think any of this is to do with altruism; it is about supporting science because science is incredibly important both from an industrial point of view and in achieving some of our public sector objectives, whether health or environmental issues. The Treasury rightly looks to get value out of the funds it puts into science. Where I think there might be a difference, is that I do not think I would put fundamental science in a different category. In terms of both public sector objectives and wealth creation, it is very important to have a very dynamic science base, doing basic research. There is a lot of evidence towards this end. Then you also need to have some research that is more applied pre-competitive research. What is interesting about the spending review is that we have not only made very substantial increases to the basic research, which is fundamentally the research councils, but we have also got the technology strategy money, which of course is pre-competitive applied research. That is also very important in terms of getting some of the science and technology into wealth creation. Fundamentally, you need both of these if you are going to achieve the objectives we have.

Q170 Dr Turner: What performance indicators are you using to measure the progress, and what difference do you expect to see in ten years' time?

Mr Boateng: We set out a framework in Annex B, which contains a range of metrics we will be monitoring to track progress against the ambitions set out in the framework, and these build on the metrics underpinning the DTI's PSA target on science and innovation, but they go wider than this in order to cover my colleagues' contribution in the DfES and the totality of the framework. Departmental spending takes place within the context of public service agreements. They set out what the public expect the Government to deliver within the resources being invested. The science innovation PSA is supported by clear targets, which the Government and others can track performance against, whether it is measures such as research citations, patents *per capita*, spin-out capacity—all of those are there. I think you will find the range of metrics in Annex B the most helpful.

Dr Howells: Can I answer Dr Turner in a different way? We are also looking for more people to be studying science, and that means that we have to watch very carefully how many people are coming out of schools and further education, and how many people become interested in science, because one of the problems that I know you are very much aware of Dr Turner, is that very often young people in school are not choosing to do science and mathematics. Even though they may well be able to

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do it, it is considered to be a difficult subject. That is a big problem for us, and we have to turn that around. That is a very basic measurement, but it is a very important measurement.

Q171 Dr Turner: One of the performance indicators is traditionally our share of global publications. The UK is slipping a bit in relative terms. It has gone down and fallen behind Japan. Are you worried at the fact that our share of publications, this output of science measure, seems to be slipping behind that of competitors? Do you think that we are not adding investment as fast as our international competitors?

Lord Sainsbury of Turville: This is an issue where you have to look at the total amount of science funding taking place. People tend to not appreciate that with more and more countries becoming developed and therefore putting more and more money into science, the likelihood is that in terms of the amount of science, it is likely to be a declining amount simply because more and more countries are becoming wealthy. It is rather like looking at Nobel Prizes over 75 years. You will find that the number we get as a proportion has gone down, but if you go back 75 years there were only two or three countries in Europe that had strong science bases—ourselves and the Germans. I think therefore you would expect that. What comes from the figures is that our remarkable performance remains incredibly good by any standards. In fact, the number of citations we are getting, which is probably more important than the number of papers produced, has increased. In terms of scientific productivity, we are the highest in the world; so I do not think we need worry if our proportion of scientific papers has marginally gone down. I do think though that if we had not started putting more money into the science base in 1998, we would have been in a position where in due course we would have been seriously at a disadvantage.

Q172 Dr Turner: I totally agree with that. Do you think we have reversed the investment decline which had been going on in time, and do you think we have injected enough already in time to maintain our absolute if not our relative position?

Lord Sainsbury of Turville: The amazing thing was that we continued in the late eighties and nineties to still turn in a remarkable performance, at a time when other countries were increasing the amount of money going in, and ours was flat, and we were doing it in facilities that were getting increasingly out of date. We appear to have gone on doing very good science throughout that period. Whether, because there are terrible lags in these things, it will be discovered that we did not have quite such a good performance during that period remains to be seen. The remarkable thing is that we did go on doing such good science. As I say, if we had not put that extra money in, we would now be beginning to see the really serious effects of it.

Q173 Dr Turner: The consultation exercise you carried out did not start until March, and did not last very long. Just how useful was the consultation process in drawing up the paper?

Lord Sainsbury of Turville: I think it had some value, and it was important to do that when doing an exercise of this scale. Of course, the fundamental debates on this were about what was the target that we should be aiming for, and how we should think in terms of reaching that target. That is a very difficult thing, to get very much value out of consultation, which always tends to be people highlighting particular individual problems. I think it was useful, but the major debate was on this overall framework. That was not really addressed in the consultation.

Mr Boateng: Can I give you one area, Dr Turner, where for me personally the consultation was of particular use? At every event that we had at Number 11, without exception—and we had seminars, breakfasts and other working occasions when people came together in the Treasury and elsewhere—at least one person, and more often than not several people, raised an issue that has a bearing on references colleagues have made to Germany and Japan, where there has clearly been perhaps a greater emphasis on the role of technicians in underpinning a science, technology and innovation capacity than has traditionally been the case in this country. I was very impressed by the way in which that became a recurring theme. Therefore, certainly when I was reflecting on the spending review priorities—and colleagues from the DFES will confirm this—I came back again and again to the role of FE alongside the role of HE, because sometimes in relation to this area we forget the importance of FE. We forget, for instance, the very interesting work that the Committee will be aware of which has come out of the US, in terms of the role of community colleges and their links with some high prestige universities in the US, and the way in which community colleges have been a driver of productivity in US IT. I think they are lessons that we need to learn about the relationship between FE and HE, and ensuring that we invest in the skills base that produces technicians to work in this area. The insights there came from the process of consultation.

Q174 Mr McWalter: My question is about research and development, and there are two contexts. First, I simply do not agree with Lord Sainsbury at all that it is all going swimmingly and “steady as she goes”. If I thought that, I probably would not be on this Select Committee because I think there is a tendency for things to go very badly wrong in science policy. The second issue is that research and development in the UK is about a third of the level per employee of that in the US. Midway through the framework report it says that the low investment in defence in the 1980s and the low level of investment in public services in the 1990s produced historically pretty low levels of research and development quite generally. What we have here is a plan which says, “currently it is 1.9% of GDP and, discounting the private sector, it is going to go up to 2.04% over 10 years”. That is 8% of the current level over a 10-year period. Do you honestly think that this is remotely ambitious enough to redress the deficiencies of the system that the report itself draws attention to?

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Mr Boateng: I share with you, Mr McWalter, your sense of urgency in this area, and I think we all do. There is no sense of complacency in that regard. We have set out an ambition for total R&D expenditure in the UK economy to reach 2.5% of GDP by 2014, comparing, as you rightly say, to a current level of 1.9%. It is a challenging target. It will stretch us. We believe it is achievable. It would, I suppose, have been open to us to go for the EU target, which is 3%, but to be frank with you, that in our view is not a realistic one. This was a judgment call, and to achieve the target that we set ourselves it is important to remember that public and private expenditure on R&D will have to rise faster than the trend rate of GDP growth over the period, if it is to be achieved. We have made resources available in the SR 2004 spending review, in line with this objective, including the extra billion for the UK science base by 2007–08 to give us that real term increase of 5.8%, but reaching the target as it is, is an ambition.

Q175 Mr McWalter: Is that because you are putting most of the emphasis upon the private sector, which has three times more to do than the public sector?

Mr Boateng: It is not a certainty. It will rightly require a strong partnership between business and government, and what this—

Q176 Mr McWalter: It might require strong government committed to science in a way that this document pretends there is a commitment to science, but in actual fact most of the work is going to be done by the private sector.

Mr Boateng: David will give you his take on it, but it seems to me—and it is not just because I am Treasury—“and I suppose he would say that, wouldn’t he, because he is Treasury?”—a real term increase of 5.8% is a lot of taxpayers’ money. We are committed to working with this to ensure that the long-term public investment in raising R&D is matched by a similar effort in the private sector. No doubt you will want to come on to how we go about doing that, but 5.8% in real terms increase, is a lot of taxpayers’ money.

Lord Sainsbury of Turville: First, I did not say everything was going swimmingly well; I was responding to a question about the quality of British science and its productivity, which remains as good as anywhere in the world. Clearly, we have a problem about the amount of R&D we are doing in this country. That is mainly though a problem about the amount of business R&D that we are doing. This plan sets out that we will go from 1.9 to 2.5. That will require both the private sector and the public sector to increase spending by 5.8% *per annum* in real terms, which is a pretty demanding target to go for. That is against a background where R&D and business is going up above 4.1% in real terms *per annum*. These are very demanding targets. If we were to achieve those over this ten-year period, we are talking about an extra £16.5 billion *per annum* going into the science base, in real terms a 75% increase. I would have thought that was realistic. If you start going more than that, it is simply not a realistic

target. This would get us up to about 2.5%, which will put us among the leading nations in Europe. I am doubtful how many of the big countries in Europe will get to the 3%. You have some of the Scandinavian countries getting to that figure, but that tends to be because they have for their size rather large numbers of very big international corporations. I do not think you will see very many other countries getting the 3%, which in any case is a target for the whole of Europe not for each individual country, because it is accepted that not all countries will get to that.

Q177 Mr McWalter: Are you not astonished that this figure includes actually a decline in government R&D other than the science base? Presumably, the NHS needs an increased level of research and development. It looks from the figures, going down—

Lord Sainsbury of Turville: That is essentially a level field. Of course, it is going up very substantially because it is going up in parallel with the increase in GDP and inflation. The big figures are the science base and the private sector in terms of the total cash.

Q178 Mr McWalter: One of the other issues here obviously is this. What is the capacity of the private sector to be able to make these extraordinary improvements? Do you have research that suggests they have the capacity to grow at that rate?

Lord Sainsbury of Turville: As I said, the figures are that they have been growing at about 4.1% per annum in real terms, and after a period of fairly steady decline from the eighties, when it was about 1.5% down to 1.16% in 1997, it has begun to come up again and is now 1.24%. We have turned the corner on this, but I have no doubt that this is an ambitious target to go to and that is why a lot of the schemes on knowledge transfer and the actions of DTI are about trying to get businesses to put innovation at the centre of their corporate strategies.

Mr Boateng: Mr McWalter, UK business cannot afford not to place innovation at the heart their competitive strategies. Many world-class businesses already do this, including a number that are based here in the UK. The CBI has given a very clear lead in this area—the recent reported comments of Digby Jones that innovation is the key to the UK and its competitive advantage and the welcome he gave to the ten-year plan in that respect. You asked earlier about the nature, effect and impact of the consultation. The R&D business community was very much involved in the consultation and sent a very clear message that a 2.5% target would be stretching, but that it was achievable. When you look at the range of incentives that we have put in place to encourage greater business investment—the R&D Tax Credit Scheme, and, as David mentioned, the DTI’s Technology Strategy, incentives to research councils to work collaboratively with businesses, encouraging innovation from research undertaken by Government departments—and the leadership that Sir David King has given in terms of getting the chief scientists in all the Government departments to take a good, long, hard look at R&D

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within each of those departments and see what they can contribute to the piece is important. I would also make the point that in giving RDAs greater responsibility for promoting regional innovation and the promotion of the UK with all its constituent parts as a global location for R&D investment, that is all playing a part in creating a context in which R&D spending by business is supported and encouraged. I am more hopeful than you will be in that regard.

Q179 Mr McWalter: You mention tax credits, and we welcome those, but how can you ensure they do not just benefit those sectors that are already investing heavily in R&D such as the pharmaceutical industry, which is trotted out very regularly? I note, for instance, that the Taylor report recommendations on nano-fabrication facilities seems to have gone completely missing in all of this strategy, and I wonder whether you are taking current industries and giving them a tweak, rather than looking at capacity for radical new initiatives of the sort that will guarantee the future economic prosperity of this country.

Mr Boateng: I am not sure that that is fair, Mr McWalter. The reality is that over 11,000 tax credit claims received from small and medium size enterprises since the scheme was introduced in April 2000 have produced at least £600 million since the inception of the credit. It is early days yet for the large company credit. That was only introduced, as you know, in 2002. However, early indications indicate significant interest in the credit by eligible firms there. The take-up has been good, and it has made a difference. You will have your own view, but as one gets out and about and talks to firms at the cutting edge, you do get a strong sense from them that R&D tax credits have made an enormous difference.

Lord Sainsbury of Turville: R&D tax credits have been probably most favourably received in the small, hi-tech businesses. In some of the biotech companies, this has been enormously helpful to them because they can get the cash even if they do not have profitability. This has been hugely helpful to those small biotech, hi-tech companies, which would be just the kind of people we would want to incentivise.

Q180 Mr McWalter: Of course if you have a nano-fabrication company that is still pre-revenue, it will be much more difficult for them to reach that stage.

Lord Sainsbury of Turville: The whole point of the scheme is that you can get it even if you are not making profits. Can I deal with your point about nano-fabrication, because that has not slipped away at all.

Q181 Mr McWalter: It has gone quiet!

Lord Sainsbury of Turville: Actually, we are already making the first investment. What has changed is that as we have looked at this in more detail, and looked at the proposals, two things have become clear. First, nano-technology manufacturing is a series of technologies, not just one, so having one or

two is not sufficient; you need a range of them. Second, because we have been slower in this country in getting into the micro level and we need to go into that level first, because unless you do that you cannot get into a nano-technology level.

Q182 Mr McWalter: I am aware of micro technology investment; I was referring to the nano-technology level.

Lord Sainsbury of Turville: No, but if you go straight—

Q183 Mr McWalter: I am short of time, so I would like to ask one more question.

Lord Sainsbury of Turville: If you do not do that, you can have a big nano-fabrication facility, and it will be a white elephant, as we are finding in various parts of the world, unless you go through the micro level first.

Q184 Mr McWalter: I know some companies that would not think that. Dr Howells, you mentioned Pasteur. I am asking questions about research and development and, in a way, research is often the bit that is the pure bit, and then development is often regarded as the application. Would you not agree that there are clearly some research projects that have a greater probability of improving the gross national product than other research projects, and in a sense is it not part of your job in the DTI sometimes to make sure you make that judgment of probability and make relative levels of investment to, as it were, back what looks more likely to be the winner? You are very, very reluctant to do this and have a very hands-off approach; but does that mean that you in your turn are failing to take the decisions which would lead to the health of our economy in 25 or 30 years' time?

Dr Howells: No, I am in the Department of Education and Skills, of course; Lord Sainsbury is in the DTI.

Q185 Mr McWalter: I beg your pardon.

Dr Howells: I do not agree. We have very many initiatives and schemes—a bewildering number I think—all designed to encourage research to move in certain directions, to encourage scientific research and engineering research about which we have not talked very much so far. There are sets of initiatives there. In a way, you are asking me to rattle the cage of vice chancellors, which are very reluctant to do it.

Q186 Mr McWalter: Why?

Dr Howells: Within universities there is academic freedom, and it is something we have to protect. They will decide what it is that they want to research. I would hope that that would be done with the encouragement of Government, to co-operate and work in partnership with the private sector. You have mentioned, Mr McWalter, the pharmaceutical industry, and there is some very important work going on there. We probably have as many sectors in this country *per capita* as any advanced country, in terms of that kind of research going on. I certainly believe that there is sufficient encouragement there,

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but I return to my earlier point: the bit that worries me is that we are not making science and engineering attractive enough to enough young people to go into universities in the first place, and that is the big job.

Q187 Dr Turner: If you strip out R&D in biotech and the pharmaceutical industry, you do not have much left because British engineering has traditionally invested very little of its turnover in R&D. Are you seeing any changes in behaviour as a result of the tax credit system being available?

Mr Boateng: I think we are. David will give you his take across the piece, but I just want to share with the Committee, since you ask the question, about a visit I made to Aberdeen at the beginning of this year where I met the founder and managing director of a company in the forefront of the supply of sub-sea tools and sensors for remotely operated and autonomous underwater vehicles. This is top-notch engineering, and they are world leaders. The company is winner of the Queen's Award for Innovation; it has the Royal Society of Edinburgh's Millennium Award, and Queen's Award for Export achievement: it is a remarkable company. As a result of that visit, the very clear impression that I got was that the single most important development in terms of Government policy for that firm was the R&D tax credit, undoubtedly. That is what that particular hi-tech engineering company was telling me. My sense is—David will have the bigger picture—that they are by no means alone in that respect.

Q188 Dr Turner: With increased research council funding, how much of that additional funding will be needed do you think if research councils are going to meet the full economic costs of publicly-funded research? Is it possible that we could have a situation where we are actually funding projects fully, but not increasing the number of projects?

Lord Sainsbury of Turville: The figures are likely to be that we are funding somewhere between 60 to 70% of the full economic costs. This is with the increased money for sustainability. If we were going to fully support them 100%, then you have to add on 50% almost to that figure. Of course, the situation is not that you have to rely on research council funding for the full economic cost of a project. That is what QR money is for, to provide the other side of this in terms of the overhead costs.

Dr Howells: We would have to find about £500 million a year more—

Lord Sainsbury of Turville: It is about 50% more on top of what the research councils will be given.

Q189 Dr Turner: You have put an extra £90 million in to support charitable research funding. Will that be enough to cover full economic costs of charitable research funded projects in universities?

Lord Sainsbury of Turville: No, it will not again, but this is to help bring them up to a situation where they are not at a disadvantage compared to projects which they are getting from research councils.

Q190 Dr Turner: There is evidence to suggest that people no longer apply for EU Framework Programmes, never mind if they can fight their way through the bureaucracy of them, because they cannot pay economic costs. Is there any realistic chance of getting the EU to increase its funding towards full costs?

Lord Sainsbury of Turville: I think there is something of a misunderstanding here, which is to say that you can only take on projects where you get full economic costs. That is not the case. We are saying that it is important that when people are applying for research grants they know what the full economic cost is. They will not get full economic costs from the research councils. We are saying that you should know what the full economic costs are, and in going for projects you should have available to you ways of making up the difference through QR money or other money. There is nothing to stop people going for European grants, even though they do not get full economic costs. In regard to whether it is realistic to think we will change this, we are doing a lot to try and move it in that direction and get funding on full economic costs. However, the reality is that because other countries tend to fund their universities on a different basis, in which a lot of the infrastructure cost is given in the form of grants to cover that, it is unlikely that we will move easily in that direction.

Q191 Dr Iddon: I want to look at regionality, starting with the regional development agencies. With one or two exceptions, this Committee feels that quite a number of regional development agencies are not up to passporting the money for science and innovation through their individual regions. I am fortunate in that I come from the north-west, as you know, Lord Sainsbury, and we have an excellent set-up there, in my opinion; but that is not the same in all regions. Would you like to comment on that? How will you improve the other regions?

Lord Sainsbury of Turville: The north-west led the way on this and were the first to have a science and industry council, which Tom McKillop of AstraZeneca was the chairman of. They set the standard for this and have done an amazingly good job on that. The north-east has also been one of the leaders in this. I am hugely encouraged now that all the other RDAs are setting up science and industry councils, and by the end of this year they will have science and industry councils, with on the whole good people on them representing both academics and industry. I hope that will help them make these kinds of decisions.

Q192 Dr Iddon: Who is going to audit that huge flow of money and see that it is spent to best effect?

Lord Sainsbury of Turville: This money is coming out of the single pot. In most cases it is part of that, and is subject to the same kind of review as all their other funding. We will obviously be looking at that. With those science and industry councils, that is a

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very good way to make certain that there is an overview as to whether the money is being well spent.

Mr Boateng: It is worth remembering that RDAs agreed targets with central government in return for their funding, and they have agreed that their targets and tasking framework will include measures of business university collaboration so I would certainly expect that to feature in the monitoring process, and we will all be very much on their case.

Q193 Dr Iddon: This Committee has also been rather critical of the way that money has been siloed in the past, for example the seven research councils, but interdisciplinary work is emerging slowly. The same is true in other areas of science expenditure. As you know, I am involved in a project that crosses between industry and education, and it is very difficult to keep some of those projects going; so what is the Government doing to channel money into real innovation that crosses state departments and crosses disciplines?

Lord Sainsbury of Turville: With the setting up of RCUK and now the further changes we have made that are bringing it even closer, we are now seeing a great deal more multi-disciplinary projects. That is beginning to go rather well. I am not quite certain what your second category was, where you have a split between—

Q194 Dr Iddon: Industry and education. I am talking about the technical innovation centre which you are well aware of; it falls between two state departments in a way. You tend to get passed from pillar to post if you are not careful. This is for the revenue expenditure, not capital expenditure.

Lord Sainsbury of Turville: Of these innovation centres. I think you have to see what the basis for them is, and it usually is that they are funded by HEIF money in some cases and partially by RDA money. That is a perfectly sensible way to do it, and it is a question of both the university and the RDA making a long-term commitment to those projects. As a whole they are doing that rather successfully.

Q195 Dr Iddon: Turning to universities, this Committee has been rather critical of the research assessment exercise, but with changes the next one is obviously going to go ahead. That has looked at R&D excellence and channelled the money into a shrinking number of SET departments as a result. Now—and I do approve of this late move—it seems that the Government are now going to keep SET departments open in the regions, which might otherwise close because they are not in the top excellence brackets. What has caused that change of policy of the Government?

Dr Howells: If universities decided to close certain departments, there simply will not be the capacity there for the study of subjects like chemistry, physics or engineering. We want to be certain in our own minds that that capacity is there, should it be required. It is a very difficult call because universities have to decide where they are going to spend their own money. We have to talk to them about a

decision as serious as closing a chemistry department. These are not easy decisions for universities to make, nor indeed for the department to make, but we are very serious about ensuring that capacity is out there, and we are doing what we can, in discussion with the universities and the RDAs, to protect that capacity wherever we can. We are in the early days of talks on that subject. As you know, there has also been some discussion about asking universities to hold off for a year if they decide they would like to close a particular department like a chemistry department, so that we can concentrate on how it might be possible to keep that department open.

Q196 Paul Farrelly: One of my concerns when we did the research assessment exercise report, which discussed this very subject, was the extent to which the policy on variable tuition fees would compound and exaggerate those effects on science departments. How does that change also square with the policy on variable tuition fees and introducing the market more explicitly into universities?

Dr Howells: It goes back to an answer I gave earlier, which is about how we inspire young people to want to do science and engineering, and how it might be possible to raise the application levels for those kinds of subjects in universities, including those universities which receive the most science research money. That is the main issue there. The variable tuition fee of course has not come simply as an increase in that fee; it has come together with a very, very good funding package. When I took this job on five weeks ago and started to look at it—we have a very distinguished member of the Treasury here, and I thought that this must have been a difficult thing to get past the Treasury because there are no up-front tuition fees; you can borrow—

Q197 Chairman: Let us not get back into it. It saddens me, of course!

Dr Howells: Mr Chairman, this is a very important answer to this question because there is an assumption—

Q198 Chairman: Go on then. Be quick!

Dr Howells: No, it needs answering. There is an assumption that somehow variable tuition fees will put people off studying science. I do not follow that at all. In fact, I think the new funding arrangement will encourage people to study subjects because they will have much more confidence that they can handle that loan and those repayment terms, than they have with the present one, which I have to say I was the Minister who brought it in.

Lord Sainsbury of Turville: You will have noticed in the *Financial Times* this morning the survey of universities, responding much more to trying to have vocational courses because of the pressures coming on them from students, who are now looking more seriously at the jobs which will follow on. This has always seemed to me one of the likelihoods which would come from that. I think that will act towards science and technology because it will be seen that these are useful skills to have in the world outside.

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Q199 Dr Iddon: I would have thought you would get plenty of support on this Committee, Kim, for trying to keep important departments open throughout the regions in the country, which is what we are largely discussing. How can you square that with the research assessment exercise, which is pulling in the opposite direction; and with the independence of vice chancellors and academic freedom in general across universities? Take Swansea, for example, where we are having great difficulty persuading any vice chancellor in Wales to keep a department of chemistry with two qualities of excellence open.

Dr Howells: Yes, we certainly need to be very assiduous in making sure that we are aware of those trends and what universities want to do in terms of departments like chemistry, physics and engineering, absolutely. When I started reading for this and read what I think is the tremendous report that has come out of this Committee, the Research Assessment Exercise, re-assessment, it struck me that we have still got a very considerable spread of research in this country. It looks sometimes as if it is skewed towards the south and the east, but if one looks at the collaborative research that is going on, and very much the applications of that research, then it has a much more equitable spread across the country. You may know, Dr Iddon, better than I, but I do not think there is a region in the country that has not got a first-class research—or a university that is up there in the top 16 or 17 in terms of the amount of research money it receives. I think that is very encouraging. What it does mean—and you have put your finger on a very important point—is that all of our higher education institutions have to think very much about collaborating with each other and co-operating in order to maintain that degree of high-quality research in all the regions of this country.

Q200 Dr Iddon: Can you be sure that vice chancellors are going to give you the notice required that within an individual university they are considering closing an SET department?

Dr Howells: I am pretty confident they can, and they are very, very keen to be seen to be encouraging what we have as a great priority, which is investment in science, engineering and mathematics. It is a strategic area for us, and we would be very surprised if moves were made to close departments without informing us that something as important as that was happening; so I do not harbour any fears about that. It is an important point.

Q201 Dr Harris: I wrote down what you said, Minister: you inspire young people by these variable fees. What part of the inspiration is from increased levels of debt in an area where we want them to go to relatively low-paid public sector jobs? I do not see—perhaps I am not creatively thinking enough!

Dr Howells: I am sorry, Doctor—low-paid public sector jobs—what are those?

Q202 Dr Harris: You are trying to inspire young people to go into science careers, and you said that this variable fee policy was part of that. We can

check the record, but you definitely said “inspired”. I am trying to work out what part of having more debt gave the inspiration to people to say, “yes, I will go for that low-paid public sector job with short-term contracts, rather than go off to the City and study something that might make me even more attractive”.

Dr Howells: As enthusiastic as I am about the new funding package, I do not think it should inspire anybody to do anything other than borrow some money. I think it is going to make the issue of going to university much less problematic than it is now, because doing away with up-front tuition fees, having access to that loan, and much better terms of repayment after you are earning at least £15,000, is a much better package than the one that is there at the moment. If there is any confusion, I hope that clears it up for you.

Q203 Dr Harris: I think there was research done to ask people whether they thought that the greater burden of debt, whatever the repayment arrangements, was an incentive or not. That research, funded by your department, suggested that the people concerned thought that it would be a greater barrier—but I suppose we can ignore research when it does not fit in with the policy.

Dr Howells: No, on the contrary; I think we should be much more evidence-based in all of the policies we have. I will say this to you: in the five weeks that I have been in this job I have not been asked very much in all the meetings that I have had with people who wanted to go to university or might aspire to it, about that funding package. They have asked me much more about what kind of jobs they will get at the end of university, and I think that is different.

Q204 Dr Harris: I did a bit of maths during the last few questions because, Lord Sainsbury, you said that public and private investment must both increase at a rate of 5.8% per year to reach the total of 2.5% of GDP target by 2014. However, table 4.1 in your document suggests that the government sector increase over that period is 21.2%, that is from 0.66 to 0.8; and the private sector from 1.24 to 1.7, which is an increase of 29%. Is it not the case that you are expecting a greater increase from the private sector than you are from the public sector in percentage terms from the 2004 base?

Lord Sainsbury of Turville: Can you give me the figures again?

Q205 Dr Harris: Table 4.1 shows that the combined government sector, that is basic science and other government R&D, is 0.66, and that will rise to 0.8 if you are to meet the 2.5% target—that is the contribution towards the 2.5% target—whereas the private sector has to go up on the same table from 1.24 to 1.7, which is an increase of 29% compared to the 21%. Is it not the case on those figures from your own report that you are expecting private R&D to increase more than the government R&D contribution to that target as a proportion of GDP; and is that the Government not leading by example?

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Lord Sainsbury of Turville: I am sure that the calculation was done on the basis that it was 5.8% for both of these. I do not have my calculator to check that. I rather assumed that the Treasury had got those calculations right. That is the basis of it.

Q206 Dr Harris: I hesitate to say it is a dangerous assumption.

Lord Sainsbury of Turville: We will clarify that.

Q207 Dr Harris: You also mentioned that you thought it was okay that the Barcelona target of 3% applied to the whole of the EU, and because it did, not to individual countries, that it was okay to leave it to the Scandinavians and have Britain only making 2.5% four years after the 3% target. So when the Prime Minister signed up to this 3% aspiration in seven years' time, did he do so on the basis that it would be okay for the UK to be in the second division, and others could drive that target forward; or did he on the contrary think, "it is a stupid aspiration, but I will just go along with it"?

Lord Sainsbury of Turville: It was always understood that this, in terms of all countries reaching this, was a very tough target to go for.

Q208 Dr Harris: It is an average then, is it not?

Lord Sainsbury of Turville: It was put on the basis of an average, and on that basis we accepted it because we thought it was very unlikely that all countries would be able to achieve that. As I said, there is a difference between some of the Scandinavian countries, which have a high level of industrial research that is driven by a small number of multinational companies, because it has the downside that if those multinationals get into trouble you can see the thing reverse very quickly.

Q209 Dr Harris: I do not understand the motivation of the Prime Minister in signing up to 3% in the knowledge, or accepting later on that we would only make 2.5% some years after, unless he understood that it did not matter that we would be in the second division if that target was ever going to be met, because other countries will be above 3% for that average to met.

Mr Boateng: Dr Harris, our Government never accepts that we are going to be in the second division in terms of implementing the Lisbon agenda. Let us be very clear about that. The 3% target applies to the EU as a whole, not to individual Member States. Raising R&D intensity to 2.5% is, we believe, a challenging but realistic target, which will put the UK in a strong position to compete with leading EU Member States, and help us close the gap with the United States. The key to success in that regard will be a partnership between government and the private sector. I would be very interested to learn what your own view is as to—

Q210 Dr Harris: We could swap places!

Mr Boateng: Not yet, Dr Harris!

Q211 Dr Harris: You answer the question. I am asking about the 3% that Britain—

Mr Boateng: I am answering the question. We have made out very clearly what we believe the contribution of the taxpayer should be. If you believe the taxpayer should contribute more, then I would be interested to hear how much more that should be the case. In fairness, Dr Harris, when putting questions to David Sainsbury in relation to table 4.1 you might in fairness have referred him to paragraphs 4.13 and 4.14. What paragraph 4.13 makes clear is that table 4.1 is a possible scenario for achieving the growth rate, which in the particular case outlined in the table as a possible scenario, assumes an equal growth in both public and private sector. That is an assumption upon which David Sainsbury answered your question. I hope that helps because it was designed to do so.

Q212 Dr Harris: It is very helpful! The fact that it is not equal growth according to my calculation suggests there is a problem in the document rather than in either of our understandings. My last question was not about that; it was about—perhaps I will ask one more time. How is 3% realistic if Britain, in the first division as you would like to see it, is only at 2.5% four years after? Why is the Prime Minister signing up to this 3% when it is not realistic?

Lord Sainsbury of Turville: There is nothing absolutely magical about 3% which says that this is the figure that you have to get to be very successful. The figure for the USA, which is the most innovation-driven economy in the world, is today 2.67, so there is no magic that you have to get to 3%; and simply because you get to 3% because you put in a large amount of government funding will not give you an innovation economy. I would not put any magic on 3%; it is an aspirational target for the whole of Europe. The fact that we are at 2.5 would not be a problem.

Q213 Dr Harris: Why do you think, Chief Secretary, since we are on a roll here, that young science graduates do not go into science?

Mr Boateng: I think that is a very good question. It must have something to do with—you ask me, and I can only talk to you as a lay person—this is not my direct ministerial responsibility but I spend, like you, a lot of time talking to children and young people in my constituency, and visiting schools. I think it is partly to do with the culture in which we live and operate. One of the things that this strategy is designed to do is to change that culture, to say that we as a society put a high value on science and technology, and are prepared to invest in it. I hope that that will make a contribution. There are other issues too. Some of the work that Gareth Roberts has done around gender and ethnicity in terms of the choices that young people make when deciding on their careers, whether in science and technology, are also of concern. We need to address those issues too. I would also say, as you ask me, that there must be issues too around the environment in which the subject is taught, and that does go to some of the important work that the DfES is doing in upgrading laboratories and science facilities, and how they see—and this is important work—those who teach

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them rewarded for the decisions that they have made in their lives and careers. The DfES is addressing that too. You asked me, but I am a lay person, and the question might better be guided to Dr Howells.

Q214 Dr Harris: Perhaps your colleagues can answer the supplementary point. I am sure my colleagues will have something to say, but graduates in my constituency tell me that one of the huge drawbacks of going into science research is the culture of short-term contracts. It is a real problem. There is no tenure; it is already low paid. They are in debt at the moment or maybe, and they might want to buy a house, which is hard enough in many parts of the country. Can you show any signs of progress about tackling this problem, which is the thing that is raised with me more than anything else by young scientists?

Lord Sainsbury of Turville: Can I go back to your first question? I do not think we should start on the basis that our position in this country is worse than other countries. In fact, we probably have a higher percentage of each cohort getting a first degree in science and engineering than practically any other country in the world, which is about 10% compared to about 6% in the USA. The problem of there being a switch out of subjects like physics, chemistry and engineering into biological sciences and IT is almost a universal problem, and actually we are rather better than other countries. Our major problem, as the Chief Secretary pointed out, is not at that level; it is on the technician level, where again and again the figures point to us being very poorly placed and not at the top level. As far as the issue of fixed contracts is concerned, or short-term contracts, we have done a lot of work on this. We have not made a huge amount of progress, but the situation will be radically changed with the new EU directive, which will make it much more difficult and will affect this issue.

Q215 Dr Harris: It came into force in October 2002, and still allows people to be re-appointed to short-term contracts if they could show objective reasons such as short-term funding, which of course underlies a lot of what we have here. I know there is long-term strategic funding planned in this investment, but part of the problem outside of the £23 million package for fellowships, is that so much research funding is short-term, and universities do not want to take a risk on their people and so they just employ them on short-term contracts. That means, they tell me, that no-one is interested in investing in them because they know they will probably not be around beyond this three to four years. That is why we lose, I believe—and there is evidence for this—so many to the financial services and to other careers.

Lord Sainsbury of Turville: I think it was true in the past, when all the funding was short-term and it was on an annual basis. Of course, now we are on the three-year spending reviews, so this gives much more stability. We have a record where there have not been wild swings in the amount of QR funding and others, which means that vice chancellors had

become very obsessed, quite rightly, with the degree of flexibility. I think that is less of a consideration these days, and as a result of this you are seeing less emphasis being put on the short-term contracts.

Q216 Dr Harris: Is HEFCE going to advise vice chancellors how to do something about the fact that they are being so unfair to people in these particular jobs? The fact that we have three middle-aged men being questioned by a bunch of even more middle-aged men reads into the problem of science—

Mr Boateng: You do yourself an injustice, Dr Harris!

Lord Sainsbury of Turville: Speaking as a man on a short-term contract!

Chairman: This is our youth policy!

Q217 Dr Harris: Lord Sainsbury accuses me of having a short-term contract. It is easy to say from the comfort of the Lords, but I take the point! We have a problem particularly with women in scientific careers at all levels, as you have recognised. Part of it is that they appear particularly sensitive to this question of lack of tenure, and the problem of the pressure to publish, which makes it more difficult to take career breaks. Is there not anything you can do through your department, through HEFCE if necessary, to get universities to behave better in this area?

Dr Howells: We are looking very hard, as a number of people are, at university governance at the moment, and making sure that whatever else we do we do not risk the assets we have there. We have announced, for example, an increase in PhD stipends from around £5,700 to £12,000. We are trying to address those issues, but they are certainly about university governance. They are about trying to ensure that what we have got at universities we use to the best effect. I cannot tell you, Dr Harris, if there have been discussions between HEFCE and vice chancellors about this issue. I will try and find out for you.

Mr Key: Gentlemen, can I turn to the question of science and energy. Does the UK have any chance at all of meeting the target for reducing CO₂ emissions by 20% in five years' time?

Q218 Chairman: Dr Howells, you have a PhD in energy policy, do you not?

Dr Howells: Not entirely. It is kind of energy—it is about the coal industry between 1937 and 1957, but I notice it is coming back! Obviously, this is a subject that is dealt with mainly by the DTI. I have my own views on it, and they are very peculiar ones, I have to tell you, Mr Key.

Q219 Chairman: Let us hear them.

Dr Howells: I was, as they say in the jargon these days, tasked to put a case against the building of a pressurised water reactor at Hinckley Point in Somerset, and the reactor eventually was built at Sizewell. During the course of researching this, I was reconverted to the cause of nuclear energy. I am not a great fan, I have to say, of the idea of covering Wales in windmills. I rather think that we run a very

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great risk of destroying our great historical visual heritage, and what makes it unique; and besides that, I do not think the damn things produce enough electricity anyway. I cannot see how it is possible to generate those massive of tranches of electricity. Every time you build a tower block these days, or an office block, we fill it with electronic machines, and you virtually have to build a power station to power it. I think that we are not having the kind of adult conversations we ought to be having about this.

Q220 Mr Key: I do not think any of those views are peculiar, and I agree with every word you have said; and I wish every other minister agreed as well. The Prime Minister told the Liaison Committee, when I questioned him about this back in July, that our country was going to see a generating gap. However, the Secretary of State for Trade and Industry told us on July 12 that she did not see that we were facing a generating gap. The problem is that the Government says that it is up to the nuclear industry to come to them with a proposal. Fine. Then the Government has to decide whether to issue a licence to build; and when they have built it they issue another licence to operate it. The nuclear industry is not going to come to the Government with a proposal until it gets a nod and a wink from the Government that the Government would be prepared to process this and give them the first of the two licences. Why is it then that in spite of the fact that we see more and more leaders of the environmental movement in this country saying, “we simply cannot tackle CO₂ or climate change without nuclear” the Government cannot make up its mind?

Lord Sainsbury of Turville: We have made up our minds and we have put it very clearly into the Energy White Paper. On those figures and on the assumptions we make, there is no gap which is opening up. You can have arguments about particular figures there and ask if it is likely we will get the figure of 10% of renewable by 2010, but if you make the assumptions in the Energy White Paper, there is not a gap opening up. You can also have a debate as to whether it is the right thing to have a scenario in which in 20 years’ time we come to the end of the nuclear power station which currently provides over 20%, and you see that decline; but those are issues which are judgments about the figures. As of the short-term tenure horizon, there is not a problem on the figures.

Q221 Mr Key: That is all true, Lord Sainsbury, but the problem is that there are two assumptions that have moved on, even since the Energy White Paper. The first is that it is all right to depend upon 80% of our electricity generation to come from gas imported from Russia and other sources via unstable parts of the world by pipeline; and the second assumption is the costs of producing that energy, and, as we have seen in the recent report from the Royal Academy of Engineering, the cheapest sources are gas turbines and nuclear stations, which cost 2.3 pence per kilowatt hour, compared with 3.7 pence per kilowatt hour for onshore wind and 5.5 pence per kilowatt hour for offshore wind farms. If the figures have

moved as dramatically as that in such a short period, we cannot rely on the White Paper any more; and we do surely now rely on the Government convincing the British people that this is the sensible, safe and desirable route to follow?

Lord Sainsbury of Turville: Can I take the different points in turn. Let us take gas; it does not just come from us; it comes from a whole variety of countries, and we have made a lot of moves to make certain it is reasonably flexible and there is a market so that there is energy security on the gas front. As far as short-term energy prices are concerned, that was never an assumption that said “this is the right strategy to take”. It would have been absurd to take a long-term strategy on the particular balance of prices at a particular moment, which was at that point very low. It has come up since then, but you do not do a ten-year strategy on the basis of short-term prices—it would clearly be wrong. I do not think that simply because energy prices have moved up since that point—and the gas assumption has not changed—that there is any reason to revise the strategy. The moment to revise the strategy would be if we are not reaching any of the targets, or it is clear we are not doing so on alternative sources.

Dr Howells: Mr Key, Patricia Hewitt undoubtedly knew when she made that statement that stations like West Burton, which came on-stream yesterday, with flue gas desulphurisation systems, will produce much, much cleaner coal-burned energy. I do not know how big West Burton is these days, Chairman. It was about 2,000 megawatts at one time, but it is a big station, and Cottam next door to it is also being fitted up and will come on in 2007. If that adds 4 gigawatts to our capacity, that is a considerable amount. The point is, and I think the point you are making, Mr Key, is that I am not convinced we can disband that expertise we have got in nuclear generation with any sense of equanimity.

Q222 Mr Key: We are trying to be helpful on this one. I note the silence from the Treasury, but perhaps the Chief Secretary can add something to that.

Mr Boateng: I am not in the business of nods and winks, Mr Key.

Q223 Mr Key: Well, there is always a first time!

Mr Boateng: Not this one.

Paul Farrelly: It is not often you hear Members making a very strong pitch for a nuclear reactor to be built in their constituencies but I wish Mr Key the best of luck!

Mr Key: If I may just interrupt, this is really important, because the Prime Minister thought he was frightfully clever to hook me on that one. The whole point is that if you are talking about public perception of where to build a nuclear power station, the existing sites are precisely where you have the skills base in the population and where you have the public acceptance of the existence of generating nuclear power. I regret to say that Salisbury is never likely to be a site because of the geology of Salisbury

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Plain, and there is not enough water but it is something we need to be a little more sensible about . . .

Q224 Paul Farrelly: I want to return to universities! I have a very successful undergraduate science park at Keele University in my constituency, Newcastle-under-Lyme. Indeed, the latest phase, the medical technology centre, is due to be completed very shortly. With the medical school and the new hospital, the University and the science blocks are playing a vital role in trying to develop a medical cluster in our area, which for regeneration purposes is very welcome. Staffordshire University is one of the newer universities and is also actively developing spin-off companies. However, the last time I met with the North Staffordshire Chamber of Commerce, there were concerns being expressed that recent tax changes affecting the value of companies before they start trading and making returns were deterring would-be entrepreneurs from setting up companies in the first place. That concern seems to be reflected in some of the statistics that come through about the numbers of spin-off companies being formed. They are down 50% over the last year. I wanted to ask the departments to what extent they have all recognised there is a problem there. What steps are you taking now to resolve the problem?

Mr Boateng: Mr Farrelly there is a problem and the Government recognises that there has been a period of uncertainty for the industry, which may have contributed to a decline in the formation of new spin-out companies. We are working constructively across the piece, across the departments, and also with industry to identify two spin-out models which will provide the certainty of tax treatment that the industry wants, and enable us to deal with the issue of deferring income tax and NICS charge on intellectual property compensation if and until the spin-out is successful. That is the concern of the industry. We want to create a clear fiscal environment that enables public research establishments to grow companies, based on their research. The Treasury, the Inland Revenue and the DTI are now fully considering the case for a legislative solution if necessary to this issue. We are on the case in relation to this particular problem. I would say in relation to the particular area of medicine that you referred to that the NHS funding of R&D will increase as a result of the DoH's settlement by £25 million each year for the next four years. That ought to be good news for Keele and for others seeking to work in this area, because it will provide a stronger platform for growth in government investment in medical research, including through the Medical Research Council, which will complement business and charity research efforts. It is upon that basis that we see the combined budget for medical research and R&D within the NHS rising to £1.2 billion a year by 2007–08. That is a very large amount of money.

Q225 Paul Farrelly: That is very welcome. We are seeing that in my area and other areas. What would be welcome to people who have raised this concern

directly would be to have some indication of when you anticipate the issue being resolved, sooner rather than later.

Mr Boateng: That is as far as I can go. You know how these things are, but we are working at it. It is a very serious issue. We are very grateful to all those in the industry and in academia who are working with us on it. The departments are working flat out. The aim is to get this sorted.

Q226 Paul Farrelly: The Revenue is not being allowed to drag its feet!

Mr Boateng: The Revenue certainly is not dragging its feet. On the contrary, my colleague, the Paymaster General, is very much engaged with this issue.

Q227 Paul Farrelly: Given the 10-year science framework and changes in higher education, to what extent has the DfES considered it appropriate to include a commitment by universities to keep science departments open when they conclude agreements with OFFA?

Dr Howells: Not at all, as far as I am aware.

Q228 Paul Farrelly: Do you think it might be well worth considering?

Dr Howells: I cannot see how OFFA could do that. It is way outside the regulations that have been laid down as OFFA's rules of operation. I cannot see how that could happen.

Q229 Paul Farrelly: Access to scientific knowledge.

Dr Howells: There are so many agencies out there—a blizzard of them—and if we cannot find one of those that is capable of encouraging universities to do this, and working out how we can help them with funding to do that, then we have a serious problem. I do not see that as an immediate crisis. We are not getting those signals from the university, but I do not see that as a role for OFFA.

Q230 Chairman: On page 145 of Lord Butler's report there is some interesting stuff about science. He says there that we need a part-time adviser to challenge conventional wisdom and indeed he recommends the appointment of a distinguished scientist to undertake a part-time role as adviser to the Cabinet Office section 601; and we have a Prime Minister who says he accepts that report in its entirety. What has happened, or did you miss it in the—

Lord Sainsbury of Turville: I thought we had a Chief Scientific Adviser whose role it is constantly to challenge the science and scientific advice in Government departments on these issues, and he reports of course directly to the Prime Minister and has always seemed to me to do his job in this regard very enthusiastically.

Mr Boateng: Dr Gibson, based on personal experience over the years both as Financial Secretary and as Chief Secretary, in relation to the role of Government scientific advice, that the leadership given by Sir David King across the piece in Government, directly to individual Secretaries of

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State, Ministers, and to the Cabinet, has been without parallel in its wisdom, its incisiveness and in its capacity to challenge established wisdom. I cannot commend highly enough the role that he has played. He has not at any time shied clear of a willingness to embrace controversy where he has felt that to be necessary, and I think he should be commended for it.

Q231 Chairman: We all agree with that in this Committee, but I think Lord Butler should be informed of that. It seems to have slipped by without anybody in high places making the point.

Q232 Mr McWalter: In the last couple of weeks I have talked to both the Engineering Training Board and the Royal Academy of Engineering, and on both occasions they made it very clear that they want engineering to be seen as a subject of national strategic importance. I am sure all the things you have said today indicate that you agree with that. They think the biggest way you could do that would be if some of the money could come from the science base into bursaries for engineering students, and supporting engineering faculties properly, so that they had a clear funding stream; while currently vice chancellors are slamming down departments because they are expensive to run and the number of students they are getting recruited is uncertain. Is it possible that the Government could consider using the money that is in the framework for that purpose?

Dr Howells: Mr Chairman, I do not accept that there is no money going into engineering departments; there is a huge amount of money going into engineering departments.

Q233 Mr McWalter: The fact is—I am a Hertfordshire MP. The University of Hertfordshire was founded on engineering and chemistry. Its chemistry department has shut down. Its civil engineering department has shut down. The Hertfordshire College of Building, with national status on the FE sector, has shut down. My local FE college has had all its engineering removed. However much money is going into this, all Members of the Committee and everyone we talk to has a similar story to tell. Can you not understand that there is a real crisis here, which the engineering profession itself identifies and in relation to which it wishes appropriate concerted action to be taken? If you cannot accept that, please talk to them and have another go.

Dr Howells: Mr McWalter, I have talked to them and I meet engineers, and I have met engineering organisations. In my previous role as a transport minister it was a very central preoccupation, and I do not accept that we are not producing enough engineers.

Q234 Mr McWalter: So you will not consider it!

Dr Howells: Of course I will consider it. I just said that I meet with them and I talk with them. I will certainly do that. To return to something Dr Harris asked earlier on, one of the great problems I think is

that we are producing some very fine engineering graduates, but they are all becoming lawyers, because legal firms like engineering minds.

Q235 Chairman: Or MPs and lawyers!

Dr Howells: I am sure there are.

Q236 Dr Harris: They also go into the City and financial services because they can count.

Dr Howells: Yes, absolutely, and in a sense it returns to some of the central problems about what it is that we do in this country in terms of capital investment and investment in employees. We do not pay them enough and we do not invest very often in the right ways. I do not think that the public sector can redress that deficiency on its own. We are handling taxpayers' money and we cannot simply put billions into a particular sector where there is a weakness in the market itself. It seems to me that some of the engineering sector has made great strides but there are still some real weaknesses there I think. If we are to maintain what I think is a very fine engineering sector then help has got to come from both sides, not simply from the taxpayer; it has also got to come from engineering companies.

Mr Boateng: I would say to Mr McWalter, whose frustration we all understand, frankly, in this area, that there are opportunities through the RDAs single pot funding. Northern RDAs have shown the way in this regard, in terms of their plan to support business innovation through links to research base by over £100 million by 2010. There is no doubt that a good proportion of that will benefit precisely the sort of work that Mr McWalter is concerned about. Within the context of the Lambert review generally and the work that is being done in relation to the importance of applied and practice-based research, there are some good positive signs there. The sort of frustration that Mr McWalter has outlined is well understood.

Q237 Mr McWalter: I am talking about the base that Lambert draws on, which is—

Mr Boateng: Which is precisely, Dr Gibson, why I made the point I did in relation to an earlier question about the importance of FE, and why I think it is vital in terms of the wider productivity agenda, of which engineering and manufacturing are a part, that we continue the focus that looks at FE in conjunction with HE in relation to this agenda. I just think that all too often we forget FE, and that is a very big mistake. The two things should not be put against each other; they should be seen as complementary. There are some good signs that as a country we are beginning to learn that lesson.

Q238 Chairman: Thank you very much for addressing the frustrations the Committee have. It does help, and I am sure you have enjoyed parts of it, if not all of it. Thank you very much for taking the time to come.

Mr Boateng: Thank you very much, Dr Gibson.

Chairman: We will be producing a report on this in our OST scrutiny of 2004, so it will not go unnoticed. Thank you very much indeed.

Wednesday 1 December 2004

Members present:

Dr Ian Gibson, in the Chair

Dr Evan Harris
Dr Brian Iddon
Mr Robert Key

Mr Tony McWalter
Dr Desmond Turner

Witness: **Lord Sainsbury of Turville**, a Member of the House of Lords, Parliamentary Under-Secretary of State for Science and Innovation, Department of Trade and Industry, examined.

Q239 Chairman: Lord Sainsbury, welcome once more into the lions' den. Thank you very much for coming. We have given you sight of the questions beforehand in general, so what I am going to ask the Committee, and I hope you will comply too, is that we want quick questions and short answers, if possible, within the limits of getting the message over, because I know there are people here for different questioning, in the body of six. The first question is on the discussions you have had with HEFCE regarding the proposed closure of Exeter University's chemistry department. It is a serious subject; many people are worried about it. We have asked you about the closure of departments before, as Minister of Science, if you were prepared to do something about it, and you gave an indication that you and HEFCE, at least, were involved in looking at it on a regional basis to ensure that there was some policy, and here we go again, another one, and panic buttons pressed in the universities, architecture at Cambridge, your old *alma mater*. Where will it stop?
Lord Sainsbury of Turville: In this case, I have had discussions with Sir Howard Newby, I have had discussions with Professor Steve Smith, the Vice Chancellor, and indeed Kim Howells, really both to try to understand the situation and see if there is anything we can do about it.

Q240 Chairman: Can you order them to do something? Would you be prepared to do that?

Lord Sainsbury of Turville: I cannot give them any instructions. First of all, the lead is DfES, and, secondly, there is, I think, a very strong view, which I would hold, that in this sense universities are autonomous.

Q241 Chairman: What does that mean, "autonomous", they can do the hell that they like, in a country governed by a democratic government?

Lord Sainsbury of Turville: No. I think it means that within the funding arrangements they can make their own decisions about their strategies. However, I do not think that means that government ministers and HEFCE cannot talk to them and agree with them their forward plans. I cannot see any road forward, as far as the closure of the Exeter chemistry department is concerned. They are running at a very substantial deficit on their science programmes and I do not think we can order them to do anything.

Q242 Chairman: Can you make a representation which says, "For goodness' sake, chemistry, physics, whatever, taken out of the curriculum of a

university, does what for the university system?"? That seems to me a policy matter beyond one university.

Lord Sainsbury of Turville: I think that particular question is for the university to decide what its strategy is on education. I think it is very important that we take forward the regional plans in the context of Charles Clarke's letter this morning to HEFCE, and indeed what we said in the 10-year investment framework.

Q243 Chairman: Could you say something about Charles Clarke's letter, please?

Lord Sainsbury of Turville: Yes. He is asking for advice from HEFCE about what action we should take to support on a regional basis otherwise key departments which are considered of national importance.

Q244 Chairman: I think HEFCE had asked to do this before, Lord Sainsbury?

Lord Sainsbury of Turville: We have never been asked to do this before. This is quite a major step forward, because I think in the past it has always been considered that was not a subject that should be taken up by the Secretary of State for Education, it was a matter for HEFCE, if at all. I think this letter from Charles Clarke was extremely important in saying that he wants advice on this.

Q245 Chairman: It is a bit coincidental, is it not?

Lord Sainsbury of Turville: It is a very important issue; we will have to consult on it. It was flagged up that we were going to do this in the ten-year investment framework and I think it would be wrong to have done it on the basis of just "We're worried about chemistry; give us advice about chemistry." What we have done is looked across all subjects and said are there subjects which seem to be of national importance, and they are not only science, they can be, say, a foreign language. Can I just finish with where we have got to with Exeter. I cannot see any way of dealing with the closure of Exeter. I have had discussions with Sir Howard Newby about the regional situation and he has put in place plans to make certain there is no decline in the number of chemistry places within the South West, so in that sense I do not think there will be a regional problem. Of course, as far as total numbers are concerned, at least a couple of universities, very distinguished universities, have been on to Exeter to say they

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would be very happy to take the Exeter students. Again, on a national basis, we are not going to see an impact on the number of chemistry students.

Q246 Dr Iddon: On the basis of the regional argument, perhaps you would confirm, Lord Sainsbury, the statement which has been made, last week, about that applying to only Five and Five-Star departments? It seems to me that Five and Five-Star departments would survive anyhow. What we are most concerned about are the departments which feed those departments, particularly the Four-Star departments. Perhaps you could confirm that the Government's intention is to save only Five and Five-Star departments in the regions and not down the list?

Lord Sainsbury of Turville: I think we need to go one step further back, because the issue is, first of all, how many departments do we need properly to supply the number of students; that is one issue about which we need to be much clearer. The second issue, I think, is a costing issue. It has been said by Professor Steve Smith that you cannot run a Four department on the basis of the combination of teaching money and research money, and he is saying, and I have no reason to disbelieve him, that he is losing large sums of money on it. However, there appear to be other departments, Four departments, which are running perfectly alright. I think really we do need to bottom this question out, because if it is true, as he is saying, that there are Four departments and that you cannot run them on the money you get essentially for the teaching, plus a bit of research money, then we have got to sort that out and change it, because otherwise we are going to be limited simply to the number of Five and Five-Star departments.

Q247 Dr Iddon: That is the real problem. This Committee has been arguing and people outside this Committee have been arguing vigorously that the funding formula for supporting science is totally wrong. Medical subjects get twice as much as science subjects, yet the rate of inflation for consumables and the basic equipment that science departments need is way ahead of normal inflation and the funding formula is just not delivering to any departments throughout the country teaching science. Is not that the basic root of the problem, or certainly one of them, that science departments will continue to close so long as the HEFCE formula remains as it is at the moment?

Lord Sainsbury of Turville: I think the first thing is to establish what the cost position is. To my mind, it is a major problem that we have not had up till now, and we are beginning to get only now properly-costed figures of what it does cost to run departments. That is because we have not had an agreed costing system, we have been calculating the figures on the basis of the expenditure, not the cost of running departments. I think it is very important that now HEFCE is changing that round and, on the basis of track figures, soon we will have proper costings for a department.

Q248 Dr Turner: Lord Sainsbury, the problem seems to track back very largely to the Research Assessment Exercise, which, as you know, this Committee has criticised quite heavily, both on the actual scoring itself, which can be misleading, and how you measure architecture within RAE, for instance, God knows, because it is not an experimental science. How is it that, as Science Minister, when the effects of this are so profound, you can justify leaving this to DfES, who do not have as their prime remit the health of British science?

Lord Sainsbury of Turville: I think that is where the Charles Clarke letter is important, because he said we need to make certain that we do have enough positions for these key subjects, and clearly that has an impact on the way that we fund them.

Q249 Mr Key: Lord Sainsbury, this is not just about a short-term problem at Exeter, serious though that is, this is the climax, is it not, of a long catalogue of failures in direction for British science? It is a matter of government process, is it not? There is certainly no blame attached to you personally, because you are a popular Science Minister, but is it not symptomatic of a process in government which has failed, that simply having you as Science Minister attached to the DTI, with really little effect on the Department for Education and Skills, or other departments where science is predominant or very significant, is a failure? Looking back on the process of how the Government handles science, how would you like to see things change so that we do not get into this game of last-minute pleas to the Treasury to help out? The Treasury must be rubbing their hands with glee. What has gone wrong, because it has, we have to admit that, do we not?

Lord Sainsbury of Turville: First of all, I do not think that the Treasury is rubbing its hands with glee, or anything. They are concerned to get this funding as right as possible. Secondly, I think you need to be a bit careful before you start saying this is a major failure. What we have been seeing is a concentration of research in centres of excellence. That has not gone enormously far but we have seen some of that. I have to say that, in principle, I do not think that is a bad thing. What I do think we need to make certain, and we have started doing it already, is that, in that kind of funding system, where there are pressures to concentrate on what universities do best, we do have regional plans in place to make certain there is not a regional impact, secondly, we have a very good understanding of the cost structure. Both of those things are being put in place. It is not obviously wrong that you should have a concentration of chemistry teaching and research in a limited number of centres of excellence, rather than spread round maybe 60 departments. We may well have too many chemistry departments in that sense. What I think needs to be thought through very clearly is how many we need and then make certain that we get those.

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Q250 Mr Key: That is exactly opposite to what you have just told us about the importance of university autonomy. You are saying, “No, after all they should not be autonomous, we should have a central plan for this to make sure that there is a regional dimension.” The regional dimension is out of the window in the South West because the base now is zero for chemistry?

Lord Sainsbury of Turville: It is not. There is a very good chemistry department at Bristol, there is chemistry at Plymouth. As I said, from what Sir Howard Newby has told me, we have plans in place now so that the number of chemistry students in the South West will not be affected by this.

Dr Harris: Your party colleagues criticised the drop in the unit of funding up until 1997, disaster and all that, and it continued to fall for another four years. It may well be that there simply is not enough money in the system, and so if we were to raise the ratings for chemistry and the physical sciences something else would have to give. If that is the case, should not something else give, because probably Britain plc could cope better with the closure of a media studies department?

Chairman: Or politics?

Q251 Dr Harris: Indeed, or politics. I do not think it would be so damaging to the image and indeed the productivity of Britain. Should not the Government be playing a role, through its instructions letter to HEFCE, to say, “Whatever happens, make sure we’re not losing the future of the British economy, in terms of investment, and if something has to give because there is not enough money in the system for this expansion let it not be these key departments”?

Lord Sainsbury of Turville: Again, that is what Charles Clarke’s letter is about. I would think there is a great deal of merit in the idea of universities’ autonomy. We are not in the business, and I hope we never would be, of telling universities what departments they should run. What I think we should be doing is what we are now proposing to do, which is to make clearer what we think the priorities are to HEFCE and then for HEFCE to work with the universities to make certain the funding at least hopefully steers people in the right direction and that certainly it does not get to the situation where incentive is, because of the way the funding works, to close down expensive departments which are in the national interest.

Q252 Dr Harris: That is very constructive. Do you regret not having done that earlier?

Lord Sainsbury of Turville: I think this particular problem arises because of the pressures which are coming from RAE, essentially.

Q253 Chairman: That is not you, that has been around for a long, long time. I remember it well?

Lord Sainsbury of Turville: I think it is true that, up till the last year or so, we have not seen this position where vice chancellors are taking quite such a tough view about which departments they focus on, with the impact that we have seen on the closure of chemistry departments.

Q254 Mr McWalter: We know that vice chancellors want to shut science departments, because that way they can save money and they can launch cheap subjects instead, which will balance their budgets. This Committee has said repeatedly that the implication of the RAE and the HEFCE ratios is to close science departments. You have ignored it, you treat it with complete equanimity, even the Exeter closure; you still think, basically, it was not a bad thing. Is it possible that you might actually get hold of some of these huge amounts of money that Gordon Brown has allocated for science, that £1 billion, to address this problem: yes or no?

Lord Sainsbury of Turville: Yes. We are already doing that.

Q255 Mr McWalter: Sling some of it Exeter’s way and let us keep chemistry?

Lord Sainsbury of Turville: Let us be clear. Steve Smith’s argument about the closure of chemistry is to do with the fact that he wants to support other science departments. Already, through EPSRC, and there will be more money for this in the spending round, we are putting in money for what we have called the ‘Health of disciplines’, which will be grants going to these key areas such as physics and chemistry, where we want to make certain that they grow and are important at the moment and important in the future.

Chairman: We will move on, to animal rights legislation.

Q256 Dr Harris: I think there is general agreement about the support for the measures in the Bill, the Serious Organised Crime and anything else that needs to be bunged in a bill Bill, and thank you for the work you have done on that. What about the issue of economic sabotage? There was a Financial Times report quoting directly Patricia Hewitt and the Prime Minister, saying they recognised this was a problem and that there needed to be legislation on crime, there needed to be legislation to tackle the problem of economic sabotage, whereas the measures in the Bill deal with harassment of individuals and giving the police more powers?

Lord Sainsbury of Turville: We are trying to formulate a couple of proposals in this area. As you will appreciate, it is a difficult area because there are what I think everyone would agree are perfectly legitimate forms of protest which can lead to economic impact on a particular company. For example, I do not think anyone would want to say you cannot have a campaign against a particular company where you say you should not buy their products because you disapprove of what that company is doing, clearly that causes economic damage, so this is a difficult area to formulate things. One of the things we are looking at most closely is this question of where some of our biggest problems come from, which is people attacking, effectively, the suppliers of companies and therefore trying to put pressure on them to break their contracts with companies doing animal experiments. That is

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already a civil offence. The question is whether one can strengthen it. It is a difficult area but we are working on issues there.

Q257 Mr Key: Yes, it is a difficult area, Minister, but for a matter of years now the Government has been telling us, has been telling Members of Parliament, for me, representing Porton Down, that "It's all very difficult; we're looking at it, we're working up proposals." We have seen some areas tackled and we are grateful, but the question of economic sabotage is crucial. The United States Federal Government has legislation in place and so have States in the United States. Where is the problem? The intention on your part is clear. Is it the Treasury Council? What is the problem here in doing what is done in other democracies?

Lord Sainsbury of Turville: Can I be clear that America does not have a system of dealing with this. I have talked to the FBI person in charge of this and he said "We're watching what you've done in the UK very closely because we think you've got the law right. We have laws which are unworkable and we've never used them." So there is not a situation in America where they have got it right. I agree with you totally, we need to get on and try to do this, but, as I said, it is an incredibly difficult area because of the human rights aspects, but I think now we have got something and I hope within the next few weeks we will get that agreed and bring it forward.

Chairman: The next area is research centres. You have seen the question, the principles we are asking you. Would you like to say something about that please?

Q258 Dr Turner: Lord Sainsbury, most people tell us that the National Institute for Medical Research at Mill Hill is a jewel in the crown of the MRC and a great national treasure. Have you been involved in its proposed move and reduction?

Lord Sainsbury of Turville: The decision is for the MRC to make on this. Clearly because it is an extremely important area and because of the reputation of the National Institute for Medical Research, I have kept a very close eye on this. What I think is being said by the MRC, in principle, is right, and in any case it is their decision that these kinds of institutes should be co-located more closely in universities in the future, and the access to clinical research is also very important. I am sure you have seen the membership of the Task Force which is advising them, which is made up of people nominated by the MRC Council but also people nominated by the National Institute for Medical Research. It has people on it like Sir Paul Nurse and Professor Dick Flavell, a very distinguished not only UK but international panel, and I think, as a whole, I would trust the judgment of those people to make the right decisions.

Q259 Chairman: Did you discuss with them the handling of the process, did you discuss with the MRC Board, or whoever?

Lord Sainsbury of Turville: There have been discussions I have been involved in which were about the process, to make certain that the process is a good and reliable one.

Q260 Dr Turner: You will remember, Lord Sainsbury, that the MRC tried this before at Northwick Park and it failed, and they closed the Research Institute because it was not working. Now they are trying again and it looks as if they are going to ask you for money to fund this very expensive move, at the end of which we will have made no actual gain in scientific terms but which will have cost us a lot. Do you think this is a justifiable way of spending our precious resources?

Lord Sainsbury of Turville: I think, either way, we are going to have to spend a great deal of money. If it stays where it is, this is a 70-year-old building which is completely out of date. We are going to have to spend a lot of money either way. Of course, we will look very carefully at any proposal to use the 15-year forward plan on infrastructure for this purpose and they will have to have a very good case if they want to have money for it.

Q261 Chairman: Turning to the strategies and priorities for the UK Presidency of the G8, what role has OST played in that, if any?

Lord Sainsbury of Turville: Sir David King and the Office of Science and Technology officials have been working closely with the Foreign Office, Defra and DFID in developing both the content and presentation of the G8 priorities. Clearly, science and technology are fundamental to policies both on climate change and African development. Just to give you examples, OST is chairing and contributing to working groups on climate change and has provided a secondee to the Commission for Africa to work on science and technology and higher education issues.

Q262 Mr McWalter: What role has science played in shaping the Commission for Africa's agenda and, specifically, has any cognisance been taken of the recommendation of this Committee that developing countries need science if they are to trade their way out of poverty?

Lord Sainsbury of Turville: I think we have taken that message on board very strongly. It is something which both Sir David King and I feel very strongly about and I think it is a message which DFID and I have taken on board as well. The fact that they are going to appoint a Chief Scientific Adviser and Sir David King will be on the interviewing panel for that I think shows how seriously it is being taken.

Q263 Chairman: Thank you very much. We move on now to scientific publications, if you could answer that. You will know that this has created immense interest in the Committee's Report, not just in the publishing industry but from libraries right across the country, well beyond our expectations, actually. What is your attitude to that question, please?

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Lord Sainsbury of Turville: I think the issue is not about balancing relevant interests, it is about finding the best scheme to communicate information for researchers to those interested in the research. Because of its overview of the situation and because it is a major customer, I think the Government should be supporting the best and most cost-effective way to channel scientific outputs. What we are not clear of yet, that it is demonstrable one way or the other, is that one system is, either in principle or cost, better than the other. That is why we have taken the view that what we should do is make certain there is a level playing-field, by making sure that Research Councils are prepared to fund people under either system.

Q264 Dr Iddon: I was at Liverpool last week and they were very, very enthusiastic about this Report and particularly about open-access publishing, and more particularly about our recommendation for institutional repositories, and Liverpool University are going ahead with that right now. What evidence has the Government collected that universities are not in trouble with purchasing scientific publications?

Lord Sainsbury of Turville: There is a lot of pressure on them because of this, but the question one has to ask oneself is would the alternative system, which is the open-access model, actually provide a cheaper system for universities and researchers? There is no evidence of this and there are a couple of things which mean it is almost certainly the other way round. We have a situation now where a considerable amount is picked up by companies who make use of the journals and therefore subscribe to them; of course, they produce very few of those articles. The result of that is that if you changed to an open-access model something like 10% of the total cost would move from the corporate sector onto universities and the research side, which is supported largely by Government. It is not at all clear that this would be cheaper for universities; it could well be more expensive. As your Committee itself pointed out, because of the fact that we produce a much higher percentage of the articles than we do in terms of subscription, again, if nothing else changed except move to open access, the UK would have a negative position as far as taking on extra costs is concerned.

Q265 Chairman: Why has Wellcome made the moves it has made in this area? Does that influence the process? If, as you say, the Research Councils went ahead with it too, you would be seriously embarrassed, would you not?

Lord Sainsbury of Turville: Wellcome has formed a particular view on this. If they insisted that all was going to be done on that basis and the model was used then I think it would lead to heavier costs for researchers and Government.

Q266 Chairman: But they may take that decision?

Lord Sainsbury of Turville: It is going to be a very difficult decision, because they can say to researchers "You must do this if you're going to have our money." If the publishing industry say "They cannot come to an agreement with the publishing industry," it would end up, which I think would be a very unfortunate situation for researchers, that they were not able to publish their research in respectable journals.

Chairman: We will move on to energy.

Q267 Mr Key: Lord Sainsbury, this matter is rising up the agenda considerably. What progress has been made on the decision on where ITER should be situated?

Lord Sainsbury of Turville: We had a meeting of the Competitiveness Council last week. We gave a mandate to the Commission to negotiate a six-party ITER, which obviously includes Japan. They were also given a mandate that if that failed they should go forward on the basis of a three-party arrangement. We are extremely keen that everything should be done to try to get a six-party agreement based on the main machine ITER going to France, as part of a broader approach which involves the setting-up of IFMIF, which is the materials testing site. If we are going to get this on a right agenda then we need to get that IFMIF as well.

Q268 Dr Iddon: If Japan pulled out of the project, would that cause immense difficulties?

Lord Sainsbury of Turville: Obviously, the major issue is one of cost, then also, of course, it depends on what attitude is taken by South Korea and America. It would be difficult because you have still got a lot of the cost and fewer people to bear it.

Q269 Dr Harris: For how long could this drag on, do you think, for how long would you be prepared to see this deadlock persist before definitive action was taken to move the project on?

Lord Sainsbury of Turville: I would hope that we could agree fairly quickly to go ahead on a six-party basis, that means within the next three or four months, and then have things sorted out technically by the middle of next year.

Q270 Dr Turner: If the Japanese go their own way with whomever as partners, is there likely to be a problem of accessing the technology which is already being developed at Nagaka? Will that not be available to the rest of ITER?

Lord Sainsbury of Turville: I do not think there is a problem on this. Everyone seems to agree that you could go ahead on a three-party basis, but it is a lot more expensive, clearly.

Chairman: Thank you very much. That is the half-hour, Lord Sainsbury, and we try to play fair, as you know, and we have another session coming up. Thank you very much indeed for coming and answering the bevy of questions.

Written evidence

APPENDIX 1

Memorandum from the Office of Science and Technology

OST RESPONSE TO QUESTIONS FROM THE SCIENCE & TECHNOLOGY COMMITTEE ON THE SPRING SUPPLEMENTARY ESTIMATE 2004

INTRODUCTION

Under the current Public Expenditure framework, the Resource Accounting and Budgeting (RAB) boundary includes Non Departmental Public Bodies (of which the Research Councils are major examples) as well as their parent department. Thus the DTI's Departmental Expenditure Limits (DEL) bids, settlements and final allocations include funding for the Research Councils—a major part of the Science Budget—on a full RAB basis. These are entered on the PES Database, which is the prime record for controlling government expenditure. The Treasury requires OST to actively control expenditure within annual limits for resource and capital expenditure, with certain subsidiary controls.

The Estimates and Resource Accounts boundaries focus solely on the department and therefore Parliament continues to approve a cash Grant-in-Aid for each Council within the departmental Estimate (other direct expenditure is requested on a full RAB basis). The cash requirement is determined by reconciliation to the use of the full resource and capital budgets by each Council.

Within the budgeting framework, OST maintains Resource and Capital budgets (DELs) for individual subprogrammes, including those which cover the funding for each of the individual Research Councils. End Year Flexibility (EYF) is based on outturn against resource and capital DELs, rather than cash. As such, changes to the Grant-in-Aid figures for the Research Councils only indirectly reflect changes in total Research Council expenditure, but incorporating changes in the timing of expenditure, and in the timing of cashflow.

QUESTIONS AND RESPONSES

Q1.1 *How is OST's End Year Flexibility distinguished from the main DTI allocation?*

A. The Science Budget, which includes funding for the Research Councils, is ring-fenced from other DTI programmes and is covered by a separate Request for Resources. Allocations and outturn expenditure are recorded against subprogrammes. Within the Science Budget, there is a separate subprogramme for each Research Council: there are also individual subprogrammes for other activities. OST monitors and controls unused allocations, which generate EYF, at the subprogramme level and EYF deriving from Science Budget subprogrammes is thus preserved for the benefit of Science Budget.

Q1.2 *What was OST End Year Flexibility at the start of 2003–04?*

A. Total End Year Flexibility available for the Science Budget at the start of 2003–04 was £261.4 million. Of this, £139 million related to resource expenditure, £35 million related to capital spending and £87.4 million related to capital grants.

Q1.3 *What are the rules and practices governing the transfer of hypothecated amounts of EYF between Research Councils?*

A. Treasury rules do not themselves hypothecate funding to individual Research Councils, as opposed to the Science Budget as a whole. However, OST policy, reflected in the Financial Memorandum for each Council, has been that individual Councils may carry forward any unused capital budget. In addition a Council may automatically carry forward unspent recurrent resource budget up to a maximum of 10% of its total recurrent resource budget, or more than this level with the agreement of the Secretary of State.

As part of its overall management of the Science Budget, OST arranges transfers of funding between Councils in order to match available funds to current needs where activity is moving behind and ahead of expectation.

OST is in the process of revising Councils' Financial Memoranda. As part of that process it has proposed that Councils should be able to carry forward any unspent resource budget in full, whether capital or recurrent. This will provide Councils with greater certainty against which to plan and manage their financial affairs, and is in line with HM Treasury policy to encourage departments to cascade EYF.

Q1.4 *What are the repayment arrangements?*

A. EYF is a budgetary arrangement which allows the spending of funds which were allocated to a particular year, but unused in that year, to be used in a subsequent year. This process does not involve repayment. Where EYF for individual programmes is effected by in-year transfers between programmes compensating adjustments are made to the summary of EYF entitlement.

Q1.5 *What is each council's entitlement to End Year Flexibility?*

Please see the answer to Q1.3 above. EYF is calculated annually, initially in May based on provisional outturn for the previous year: the figures are then subject to confirmation when the final outturn is determined, and then to approval by HM Treasury.

Q2. *The Committee would also like an explanation of the reallocations which took place between the Research Councils in the spring supplementary estimate, with particular reference to the decrease in funding of £38.2 million to the Engineering and Physical Sciences Research Council; the increase of £21.9 million to the Medical Research Council; the increase of £9.4 million to the Particle Physics and Astronomy Research Council; and the extra grant-in-aid funding of £11.1 million to PPARC.*

A. The reallocations of the existing Grant-in-Aid provisions in the Spring Supplementary Estimates were not transfers between Councils: they represent adjustments to the timing of Grant-in-Aid to individual Councils. Grant-in-Aid represents cash funding to the Councils, and the transfers generally reflect adjustments to the individual Councils' forecast net cashflow rather than to their total expenditure (although it is recognised that cashflow changes could also reflect changes to the level of expenditure as well as the profile). The decrease in cash requirement at EPSRC arose from a slower than expected uptake of research grants under various schemes: the increase in cash requirement at PPARC arose mainly from exchange rate fluctuations effecting the sterling value of International Subscriptions; and the additional cash made available to MRC was used to make payments due slightly earlier than would otherwise have been the case.

Q3. *The Secretary of State further indicated in a written statement to Parliament of 24 February 2004 that the Particle Physics and Astronomy Research Council would receive an additional £22.6 million and the Medical Research Council would receive £461,000 (both non-voted) of capital funding. The Committee would be grateful for a note clarifying the following points: To what purpose will these additional resources be put? Why have funds become available? How do these changes in funding allocation affect the achievement of the science, engineering and technology objectives set out in "The Forward Look 2003" and the various targets and milestones laid out in the Research Councils' operating plans for 2003-04? The Committee would also be grateful if OST could indicate from where the funding, other than the end Year Flexibility, to increase the Particle Physics and Astronomy Research Council grant-in-aid allocation derives.*

A. The items highlighted in the Spring Supplementary Estimates covered by Question 2 are the cashflow implications of the Resource and Capital DEL increases announced in the Secretary of State's Statement. As noted in the introduction, changes to non-voted Resource and Capital DEL are likely to give rise to changes to cashflow (Grant-in-Aid) figures for the Research Councils, although other factors can also affect cashflow.

Q4. *The Committee notes that, in the spring supplementary estimate, £24 million of end Year Flexibility has been drawn down to provide additional funding for the Higher Education Innovation Fund. The Committee would be grateful for a note setting out the additional activities and benefits to be delivered as a result of these increased resources.*

A. HEIF is a programme of grant funding to Higher Education Institutions to facilitate knowledge transfer activity. In this instance, the £24 million EYF which was taken up in the Spring Supplementary Estimates related to grants for projects approved in 2002-03 but for which claims were not submitted and approved by the end of the year. Any funds still not expended in 2003-04 will be rolled forward to subsequent years. As such, this draw down represents a rescheduling of funding rather than an increase in either the total resources or activity over that originally planned for the periods 2002-03 to 2003-04.

Q5. *The Committee notes that the £200,000 transfer from the Department for Education and Skills will provide funding for the Women's Resource Centre. It would be helpful to have a note setting out activities undertaken by the Women's Resource Centre and outlining the additional services that will be provided as a result of this transfer.*

A. The Women's Resource Centre will support, advise and work with Science, Engineering and Technology (SET) employers and professional bodies. Its objectives include tackling the barriers in employment which result in few women being represented in SET occupations, especially at senior levels; raising the profile of women in SET; running an expert women's database; producing good practice guides;

and developing a means of recognising good SET employers. It has been agreed that the £200,000 allocated from the Department for Education and Skills will be spent on new, innovative, undergraduate initiatives of which there are few, if any, existing ones. Recommendations include addressing the supply chain of females to SET from undergraduate courses, ensuring that undergraduates stay in SET and when they graduate they take a career on SET, examining business practices and recruitment of female SET graduates and taking into account other areas of widening participation including ethnic minority women.

April 2004

APPENDIX 2

Supplementary evidence from the Department of Trade and Industry

1. *What is the rationale behind the reduction in the number of DTI grants for R&D?*

The Grant for Research and Development has proved just as popular as its predecessor, Smart. In the 2001–02 financial year we offered 615 Smart grants worth some £33 million, but by 2003–04 this had climbed to 919 Smart and R&D grants worth £59 million.

While the DTI has been able to re-prioritise spending and fund more grants than initially budgeted, this rate of increase was clearly unsustainable and action was needed to keep expenditure under control.

Of the options that were available, the introduction of regional competitions was seen as the fairest and most effective way of continuing to support innovative businesses in England. Competitions will help DTI to manage expenditure and also ensure that those projects which best meet the selection criteria are supported.

How will the new grants for R&D affect small projects that need smaller amounts of funding?

The maximum grant for a Micro Project under the Grant for Research and Development is £20,000, which is double the maximum that was available under Smart. The maximum Research Project grant, available only to small businesses, is now £75,000 compared to a maximum £45,000 that was available for the equivalent Smart grant.

We expect the higher grants will make this new business support product attractive to an even greater number of smaller projects. It will now help bring to fruition those projects which could not be afforded with the smaller grants.

2. *What evidence is there to suggest that companies invest the money recovered through R&D tax credits in R&D? What methods are being used to monitor the effectiveness of R&D tax credits as an incentive to invest in R&D?*

Academic research indicates that tax incentives can increase companies' spending on R&D. [Work by the Institute of Fiscal Studies, for example, estimates that a 10% reduction in the cost to businesses performing R&D stimulates a one per cent rise in the aggregate level of R&D, rising to a 10% increase in the long-run.]

However, it is too early to judge what the actual effects of the R&D tax credit have been on UK business spending on R&D. R&D decisions are long-term in nature. The desired policy outcomes, such as boosting innovation and productivity, typically emerge some years after the initial investment.

The Government is committed to a thorough evaluation of the R&D tax credits to tackle questions such as this. Work has begun on that evaluation and a detailed strategy is in place.

The evaluation comprises a number of elements to examine different aspects of the tax credit—for example, the level of awareness and take-up of the tax credits, the operation of the claims process, the impact on R&D spending and the effects on innovation and productivity. The evaluation will be a long-term project reporting over a number of years, with the earliest findings likely to be available in the middle of 2005.

3. *The Investment Framework identifies the availability of proof of concept funding as an area of continuing concern. What new measures are the Government and Research Councils taking to address this issue at both the supply and demand ends? (Q 118)*

Awards have been made this year under the second rounds of HEIF and PSRE for proof of concept activity. This funding covers 2004–06. Discussions on the third rounds of HEIF and PSRE are still at an early stage and we will be consulting extensively with stakeholders on the development of these funds.

4. *Is it envisaged that Research Councils will have to reduce the number of projects that they fund in order to meet the full economic costs of research? What measures will be taken to ensure that the volume of research does not fall? (Q 131)*

No. Research Councils will not have to reduce the number of projects they fund. The percentage of full economic costs to be paid, taking account of the additional funding provided, will be calculated so as to preserve the existing volume of research.

An additional £120 million per year from 2005–06 was allocated in the 2002 Spending Review, with a further £80 million per year from 2007–08, allocated in the latest Review.

5. *The Spending Review states that the Research Councils will need to undertake an ongoing programme of monitoring, benchmarking and dipstick testing to avoid price inflation in grant applications as a result of the system for recovering the full economic costs of research. Will the Research Councils be given extra resources to carry out this work (and if so, how much), or is it envisaged that they will still be able to meet the target of reducing their administrative spend by 10% by 2007–08? (Q 134)*

OST does not provide a separate funding stream for Research Council administration. Such costs are met from their overall resource and capital budgets which are rising as a result of the latest and previous Spending Reviews.

Whilst Research Councils will incur some initial costs in implementing changes to their systems, these are expected to be modest and will not affect the undertaking to reduce the proportion of total Research Council spend devoted to administration over the Spending Review period.

6. *What incentives will be provided to UK researchers to compete for Framework Programme funding whilst FP funding does not pay full economic costs? Is the Government considering providing match funding for those who obtain Framework Programme grants in order to cover overheads? (Q 139)*

The Government is raising awareness in Europe of the importance of funding research sustainably and will continue to monitor the consequences of the EU regime falling short of the ideal for the UK.

The Government believes that University Vice-Chancellors should retain maximum flexibility and discretion as to how QR grant funding is used and that this view is shared by Vice-Chancellors generally. The Government does not therefore propose to provide a separate hypothecated element within the QR funding stream to support EU-funded projects, which would reduce such flexibility. However, the substantial increases in funding to enable Research Councils to pay a higher percentage of the Full Economic Costs, and the commitment to further increases in future, will increasingly release QR resource previously required to underpin such projects. Together with increases in DfES funding for research this will allow universities greater opportunity to co-fund research projects, from whichever source, which align most closely with their strategies.

7. *Who decides which research departments are of sufficient regional and national importance to be kept open and what criteria will be used in making such decisions? What will be the role of Sector Skills Councils, the Technology Strategy Board and the Research Councils in this process? (Q 142)*

Ultimately any decisions taken on individual research departments will rest with the individual HEI concerned. However, before that decision is taken Government wants to ensure that due consideration is given to both regional and national capacity in particular subject areas. That is why we have asked HEFCE to explore with HEIs and other bodies, the possibility of agreed notice periods and possible additional funding for particular Departments where there is evidence that their closure would lead to a weakening of either regional or national provision. HEFCE will also set up an expert group, including business and scientific leaders, to review how falling Science, Engineering and Technology (SET) provision will affect long-term regional and national economic development and whether there is a greater role to be played by business, funding councils, HEIs and other stakeholders in securing future SET provision.

8. *What impact will the regionalisation of research have on the Research Councils? How will Government ensure that the drive to support regional projects does not compromise the Research Councils' policy of supporting excellence wherever it occurs?*

The Government and Research Councils remain committed to fostering excellent research wherever it is to be found in the UK.

The Framework document sets out a number of actions to improve the capability of local business and regional bodies to engage effectively with the science base. These include; the sharing of best practice between RDAs, Research Councils, local business and HEIs through the setting up of science councils in every region, secondments from the science base to RDAs and support for business focused research. Such activities, and wider engagement with the science base, complement rather than conflict with the activities of Research Councils.

9. *What impact have “Golden Hellos” had so far on the number of new science teachers?*

DfES’ records show that since Golden Hellos were introduced in 2000 the number of entrants to teacher training courses in science has risen by 21%, a very encouraging increase indeed. The average degree class of graduate entrants has also risen, as has the proportion of trainees who successfully complete their courses and take up teaching careers. The proportion of science trainees gaining Qualified Teacher Status that go into teaching in the maintained sector has risen from 78% in 1999–2000 to over 83% in 2002–03 (Source: TTA Performance Profiles, excluding trainees with unknown destinations).

The year-on-year figures are:

1999–2000:	78.0%
2000–01:	81.6%
2001–02:	84.8%
2002–03:	83.4%

What consideration has been given within DTI to the possibility of DTI providing funds for this newly-expanded scheme?

It is right that funding is provided by DfES. However my Department is very concerned that young people should be encouraged to take up careers in science and technology.

It is essential that teachers are equipped to generate enthusiasm and confidence among their pupils and to ensure that their pupils understand the benefits of pursuing science careers. We work closely with DfES on issues relating to activities to inspire children and in supporting teachers. We work closely too with other organisations that are keen to encourage young people to see the relationship between the sciences, technology and maths (STEM) curricula and the world of work. In particular, this Department provides funding for SETNET and the UK-wide network of SETPoints which act to channel into schools the schemes, awards, competitions and curriculum resources provided by industry. They also operate the Science and Engineering Ambassadors Programme which provides a framework within which people who use STEM skills in their employment can assist teachers to enhance the curricula.

As a measure of the importance we attach to this sort of work the Government has decided to reaffirm its commitment to continue funding SETNET at the current level of just under £3 million a year and to provide additional funding of up to £1.8 million over three years to support the introduction of 10 regional SETNET coordinators. This investment was announced in the recently published Science and Innovation Investment Framework (2004–14)

10. *Please could you set out the timetable by which Government intends to formulate its policy on nuclear energy?*

The Government’s policy on nuclear energy is set out in its Energy White paper. It recognizes that nuclear power is currently an important source of carbon free electricity, but its economics make it an unattractive generation option and there are important issues for nuclear waste to be resolved.

It states the Governments belief that ambitious progress on renewables and energy efficiency is achievable, while at the same time recognising that there inevitably must be a degree of uncertainty. For this reason it does not ruling out the possibility that new nuclear build might be necessary in future to meet carbon targets and includes measures that might in the longer term benefit nuclear; a commitment to speedier and more effective planning inquiries for major energy infrastructure projects, and the introduction of the European Emission Trading Scheme.

It makes clear any future decision to proceed with the building of new nuclear power stations will need to be based on the fullest public consultation and the publication of a white paper setting out the Government’s proposals.

In the mean time the Government’s skills and research initiatives will help maintain nuclear power as an option into the future and equally importantly, benefit current generation, decommissioning and waste issues.

11. *What progress has been on the establishment of a Sector Skills Council for the nuclear industry?*

The Cogent Sector Skills Council was licensed on 2 March 2004. It will take a strategic view of the nuclear sector to ensure that the education and training base can meet the nuclear employers current and future needs.

Cogent has established a Nuclear Advisory Council to ensure that it gathers the views of employers and their supply chain. This will enable it to better estimate demand and to scope teaching–education supply issues. Cogent also represents the Chemical, Oil and Gas, Petroleum and Polymer sectors and there are many synergies with the nuclear sector. Cogent will work with the Nuclear Decommissioning Authority (NDA), once established, and its contractors to ensure that necessary skills are available and sustained. Cogent

operates through a mix of Sector Skills Development Agency and industry funding although funding for projects is mainly sought from the joint awarding bodies for National Occupational Standards, Regional Development Agencies and Local Skills Councils.

The Nuclear Skills Group report and the prospect of the NDA have spurred other skills initiatives funded by a number of authorities and with which Cogent has been engaged. Examples include:

- The North West Development Agency is funding a Nuclear Skills Project to support the siting of the NDA in the North West.
- Project Dalton—A nuclear teaching & research centre in the new University of Manchester, merging Victoria Manchester University and the Manchester Institute of Technology.
- The “NTEC” consortium of 11 universities coordinated by the Dalton is planning to provide an MSc level programme in nuclear technology and related subjects and is preparing a proposal to EPSRC. Cogent has been asked to endorse the proposal.
- Foresight is working to develop educational material and teacher training aids for use in the new schools science curriculum starting 2005.
- The University of Highlands and Islands and UKAEA have signed an MOU with the French Nuclear Energy Agency and the University of Grenoble to collaborate on nuclear skills issues.

Industry and academic institutions are working together to further the skills and research initiatives, for example, BNFL University Research Alliances include:

- Radiochemistry with Manchester University;
- Particle technology with Leeds University;
- Waste immobilisation with Sheffield University; and
- Materials performance with UMIST and Manchester University.

The alliances involve over 140 scientists, including about 12 new lectureship posts and four BNFL chairs.

What incentives are there in place for people to enter the nuclear industry?

All involved in the nuclear industry recognise the challenge of presenting the opportunities that are on offer and attracting young people into the industry. Nuclear clean-up and decommissioning, in particular, needs to be presented as offering new and exciting challenges.

The industry’s commitment to training, skills enhancement and staff development covers a full range of training and accreditation programmes in both technical and general management areas. Highlights include:

- British Energy remains committed to recruiting young people onto its apprentice and graduate training programmes and despite the Company’s recent difficulties, 33 apprentices and 21 graduates joined British Energy in 2003–04—in line with previous years.
- UKAEA has recruited more than 1,000 people during the course of the last five years, most of whom have come from outside the nuclear industry. Its graduate training scheme, which is recognised by the senior professional engineering institutions and involves a combination of both technical and personal skills development, benefits about 15–20 graduates a year. It is also committed to recruiting and developing young school leavers onto its apprentice schemes at Dounreay for engineering craftsmen, scientific assistants and administration trainees. These schemes, allied to accreditation for appropriate S/NVQs from the local technical college, provide good quality training for some 20–30 school leavers each year.
- British Nuclear Group is among The Times Top 100 graduate employers—70 new graduates per year. It spent around £15 million on training in 2003–03. BNFL’s University Research Alliances, already mentioned above, has added to the supply of graduates with specific grounding in nuclear curriculum at undergraduate level.

Would the Government be prepared to outsource its energy provision to countries with better nuclear capacities than the UK?

The UK currently imports some electricity via the French interconnector, which is able both to import and export electricity. The level of imports and exports is constrained by the capacity of the interconnector (2GW), and is determined by the market in response to price differentials between the UK and French markets, not by the Government. In 2003 net imports represented less than 1% of electricity supplied in the UK. Decisions on the construction of new interconnectors are a commercial matter for investors. Though the interconnector links directly with France, where around 75–80% of electricity is generated in nuclear power stations, the French market is itself interconnected with other European countries, and it is not possible to tell the origins of the electricity supplied to the UK, or the fuel from which it has been generated. Imported electricity contributes to the diversity of UK supplies, and as such is beneficial to security, but it should be seen as complementary to, rather than a replacement for, electricity generated in the UK.

In common with all generation options, the initiative for bringing forward proposals to construct new plant lies with the market and the generating companies. The UK's nuclear power reactors are not solely UK designs, the UK's newest nuclear power plant, Sizewell B, was based on a US Pressurised Water Reactor design. The Government expects nuclear operators to meet the highest safety and environmental standards. Any generator wishing to build a new nuclear station in the UK would be subject to a number of approvals processes under various European Community environmental and safety directives and domestic (UK level and devolved) legislation.

What steps are being taken in the context of the Science in Society programme to promote public engagement in the debate on the role of nuclear power in meeting the UK's target for reducing carbon dioxide emissions?

The Government's consultation on the Energy White Paper represented the most significant consultation on energy policy ever undertaken in the UK. We wish to encourage sustained debate about UK energy policy generally, including the respective roles of all individual energy sources in meeting the UK's long term carbon dioxide emissions reduction targets. This is why energy and climate change are two of the priority themes in the DTI's 'Sciencewise' public engagement grant scheme. This scheme aims to maximise coherence and collaboration between parties in the debate, thus seeking maximum impact and value for money.

The Sciencewise scheme will build on past and ongoing work by the Tyndall Centre and others in this area, such as: the joint Tyndall Centre–Royal Institution debate and report on "Nuclear power—global warming escape or unnecessary risk?"; and the Tyndall Centre project into geological carbon capture and storage which is carrying out public focus groups and surveys and asking the public about nuclear power in a climate change context.

One of the objectives of the UK Energy Research Centre, which is being set up as part of the joint ESRC, NERC and EPSRC Programme "Towards a Sustainable Energy Economy", will be to bring together key stakeholders and act as a focus for knowledge transfer and public engagement activities in the field.

As we said in the Energy White Paper, any proposal for nuclear build in the future would be preceded by a White Paper and a full public consultation.

12. What will be the composition of the Technology Strategy Board, how will it be determined and how will it operate in establishing future priority areas?

The creation of a Technology Strategy Board was announced in the Innovation Report "Competing in the Global Economy", published in December 2003. The Board will consist of:

- six business people, one of whom will Chair the Board;
- two venture capitalists (with technology interest);
- one regional representative with business background; and
- one Research Council Chief Executive to represent the interests of all the Research Councils.

Board members representing the business sector (including the Chair) and venture capital community will be identified by an interview panel through open competition in full compliance with guidance from the Office of the Commissioner of Public Appointments. The panel will also select a representative from the regional business community drawn from nominations by the Regional Development Agencies. The Research Council representative will be nominated by the Research Councils. Appointments will be confirmed by the Minister for Science and Innovation.

The following Government officials will also sit on the Technology Strategy Board:

- Director General Innovation Group, DTI.
- Director General Business Group, DTI.
- Chief Economic Advisor and Director General Economics, DTI.
- Director General Research Councils.
- One representative of other Government departments.

The Chair of DTI's Investment Committee (an external appointee) will attend ex-officio, as will several DTI officials.

The Technology Strategy Board will provide business-led advice to Government on a three to 10 year technology strategy in support of the UK's long term economic development, drawing on a wide range of inputs from stakeholder groups. These stakeholder groups include the industry-led sector Innovation and Growth Teams, business organisations, such as the CBI and EEF, academic bodies (including the Research Councils), the Regional Development Agencies and Devolved Administrations and other Government departments. The Board's aim is to match business needs with what science and technology could offer, and help align Government funding to encourage businesses to exploit new technologies.

The Board will make specific recommendations on technology priorities, the allocation of funding across these priorities and the most appropriate form of intervention to support them. It will be supported by a secretariat and will be able to call upon the resources of the DTI's Technology Assessment Unit to gather evidence and assess options for technology priorities using criteria set out in the Innovation Report (paragraph 3.25) and a process agreed by the Board.

The detailed operation of the Board will be for the Chair and members to decide in discussion with the DTI on appointment. The Board is classified as an Advisory Non-Departmental Public Body and will report to the Minister for Science & Innovation.

September 2004

APPENDIX 3

Supplementary evidence from HM Treasury, Department of Trade and Industry and the Department for Education and Skills

FOLLOW UP QUESTIONS TO THE "TEN YEAR SCIENCE & INNOVATION FRAMEWORK" EVIDENCE SESSION ON 1 NOVEMBER 2004

1. *Dr Howells stated that "it is becoming increasingly difficult to differentiate between pure research and applied research or the application of science". Given the difficulties in distinguishing between basic and applied research, what steps is the Government taking to ensure that a sufficient volume of basic research is still funded? (Q 168)*

The Government's view is that basic and applied research are both important in ensuring the continued quality and world-class excellence of the UK knowledge base. The Research Councils are largely concerned with basic research and by 2007–08 their funds will have more than doubled to £3.3 billion from £1.3 billion in 1997–98. It should be noted, however, that a significant amount of their funding is also directed towards industrial and public policy goals. For example, around 33% of EPSRC research projects involve formal collaboration with industry.

Pre-competitive applied research is now handled under the DTI's Technology Strategy and by the Technology Strategy Board, and over the next three years will have funding of £320 million.

2. *How effective are your indicators at measuring progress against targets? What is the lag time after which you expect to realise the benefits of your investment and strategy? (Q 170)*

Annex B of the investment framework outlines a robust set of 40 indicators measuring the impact of investment expenditure on a number of key science and innovation areas including scientific publication and citation rates, R&D levels, rates of knowledge transfer, the supply of skilled people and levels of public engagement with science. Progress against targets for each indicator will be published annually.

We expect the benefits of the Government's investment to become fully evident in the long term. Academic studies suggest that the outputs of research are often not realised until three to six years after the start of funding and the innovation process may take approximately eight years on average.

3. *Lord Sainsbury cited the increasing wealth and development of countries such as China and India as the reason for the UK's drop in share of global publications. How would the Government account for the UK's drop in share in relation to developed countries such as Japan and Germany? Is this an issue of concern? (Q 171)*

The number of UK publications has continued to increase, but Japan has overtaken us to become No 2 in the world. Germany has increased faster than us but remains at No 4. A significant contributing factor was the steady decline in government-funding of R&D as a percentage of GDP that took place throughout the 1990s in the UK; Germany declined at a slower rate, while Japan maintained relatively consistent levels of investment and overtook the UK in the late 1990s.

However, whilst global publication share is one, raw, indicator of performance the Government believes it is also important to focus on quality measures such as global citations, share of high impact papers and a reduction in uncited papers. On each of these quality measures the UK remains ahead of Japan and Germany. Some publications have exceptional citation rates compared to others in their field. The national share of high impact papers (the most cited 1%) over the five-year period 1998–2002 was UK 4,952, Germany 4,129, and Japan 2,675.

Nevertheless, the Government fully recognises that we face ever increasing competition from other nations. We have outlined a comprehensive set of measures in the Ten Year Science and Innovation Framework, including increasing investment in research to ensure that the UK maintains its ability to produce world-class research. We will regularly monitor the UK's standing.

4. *Can you explain the reasoning behind not setting a target to increase R&D in real terms within Government departments, in contrast to the targets to increase R&D in the public and private sectors? (Q 177)*

In setting the indicative scenario towards meeting the UK R&D ambition in the investment framework, the Government made a neutral assumption about the future levels of spending by individual Government Departments on their own R&D. Aggregate spending across all departments in this area (outside support for the Science Base from DTI, DfES and devolved administrations' education budgets) was assumed to maintain its current share of GDP at around 0.3%. This implies real terms growth in the aggregate Other Government R&D total at the trend rate of growth of the economy as a whole. We have not set overall ambitions for more rapid growth in the aggregate level of R&D across other Government Departments as these budgets should properly be for Departments themselves to decide and to allocate within their spending review settlements.

To this end, and following the cross-cutting review of science and research in 2002, the Treasury has encouraged Departments to consider their research requirements for evidence-based policy development and service delivery over the Spending Review 2004 period. Following the conclusions of this year's Spending Review, Sir David King, the Government's Chief Scientific Adviser, supported by the Office of Science & Technology, is working with Departments to evaluate their research strategies for quality and cost effectiveness.

5. *Please could you provide a clarification of the figures given in Table 4.1 of the Framework document? In particular, please could you give an indication of how the "Science Base" was broken down when the Government was making its projections, and of your expectation of the contributions that will be made by the charitable sector and by the RDAs? (Q 206)*

Table 4.1 of the Science & Innovation investment Framework 2004–14 sets out an indicative scenario towards meeting the 2.5% R&D–GDP ambition, raising the research intensity and innovative capacity of the UK.

The average annual real growth rates of 5.75% implied by this scenario relates, as the text in the framework states, to both the private and public sector research bases. That is to say that the growth rate implied for the public sector research base applies to the first line in table 4.1 on the Science Base—defined as sum of spending by DfES and devolved administrations on higher education research and knowledge transfer programmes and the DTI Office of Science & Technology's Science Budget—and not to the second line on Other Government R&D.

Individual organisations within the charitable sector, and the Regional Development Agencies, will respond differently to the challenges set out in the investment framework. For example, the Wellcome Trust committed at the time of the framework, assuming current levels of investment return, to invest at least £1.5 billion in the UK over the coming five years. The three Northern RDAs undertook to enhance their plans to support business innovation through links to the research base to over £100 million by 2010. We will maintain our dialogue with the charitable sector and the RDAs about their policies and funding as part of the continuing dialogue with all funders of research on the impact of collective investment in UK science and innovation.

6. *Please could you provide an explanation of how the target of R&D at an average of 3% of GDP will be met in Europe, including an indication of those countries that will exceed this target, and those that will not meet it, and by how much? (Q 209)*

The European Union aspiration of moving towards investing 3% of GDP on R&D by 2010 recognises that Member States need to make their own individual choices on the way forward—it is a Community objective, not a target set for individual Member States. What is important is that the Member States now have a shared political commitment to increasing investment in R&D in Europe.

To assist Member States in implementing policies to support this commitment, the European Commission has produced an Action Plan ("Investing in research: an action plan for Europe"). Member States are using the Open Method of Coordination (OMC)—a process of mutual learning and peer review—to support their domestic policy making in this respect. As two thirds of the investment suggested by Barcelona European Council is to be made by business, both the Action Plan and the OMC process recognise the importance of the wider framework conditions in which businesses make investment decisions.

The UK long-term ambition to spend 2.5% of GDP on R&D should dramatically close the gap with trading partners in Europe and elsewhere. This is a challenging target for the UK—given the baseline from which the UK starts, especially with respect to business investment in R&D, an UK objective of 3% by 2010 would not be realistic.

It is difficult to predict at this point which countries will spend more than 3% of GDP on R&D in 2010. Two countries (Finland and Sweden) already invest in excess of 3% GDP and five others (Belgium, Denmark, Germany, France and Slovenia) have a stated aim to reach this level by 2010.

7. *Is it the Government's intention that the increases in Research Council budgets should be spent entirely on the drive towards meeting 60–70% of the full economic costs of research (instead of on new research projects)? If not, what proportion of the increases do you predict will be given over to new projects? (Q 188)*

The Government allocated £120 million per annum (from 2005–06) in the SR02 spending round for Research Councils to increase the amount they contribute to each project they support. The 2004 Spending Review settlement allocated an additional £80 million per annum from 2007–08 for this purpose. Details on the allocation of the resources will be announced shortly. However this additional £80 million funding is just one element of a much larger settlement (an extra £515 million over 2006–07 and 2007–08) the distribution of which is still being discussed and will be announced in March 2005.

8. *What plans do you have to ensure that universities spend their QR funds on research, for example, in support of research grants received under European Framework programmes? (Q 190)*

One of the strengths of the Dual Support system is that in addition to supporting Research Council funds for specific projects, QR provides universities with a stream of resources to apply to their own strategic objectives. The Government does not wish to interfere with the discretion that Vice-Chancellors have in deciding their institutional priorities. The Government has committed significant increases in funding to both streams of funding. The sector is fully aware of this and has been working with OST, the funding bodies and other partners to identify, calculate and recover the full costs of their research activities so they remain sustainable. Increased funding will give institutions greater flexibility in the use of their QR funds to support research from other funders, including European Framework programmes, medical charity research, increasing own-funded post-graduate students, or others.

9. *How does the Government balance the possibility of supporting ailing university departments of regional importance with its intention to fund excellent research, wherever it is found? What criteria will be used to decide which departments should be kept open? Will these decisions form part of an overall strategy, or will they be taken on a case-by-case basis? (Q 195)*

The Government's research policy is a national policy which supports excellence wherever it is located. Funding is based on the outcome of the Research Assessment Exercise (RAE) according to the quality and volume of departments' research. Universities are autonomous bodies and receive their funding as a block grant and make their own judgements about research activities in line with their strategic aims. However, the Government expects that institutions will discuss proposals with HEFCE and other relevant bodies prior to making decisions on closures. Government recognises the increasing role of RDAs in science and innovation policy and welcomes their involvement, for example in facilitating business-university links.

10. *What evidence do you have that the European Commission Fixed Term Work Directive has had a positive effect on short-term research contracts? If there is no evidence yet, what methods are you using to assess the situation? (Q 214)*

We have no evidence at this stage of the effect that the Fixed Term Work Directive has had on short-term research contracts. As higher education institutions are independent, autonomous bodies, they bear the primary responsibility for determining contracting arrangements for their staff. The Higher Education Funding Council for England (HEFCE) has asked institutions (as appropriate in the context of their own priorities) to address their use of fixed-term contracts. This is as part of the requirements for additional funding from the Rewarding and Developing staff programme. We have no plans for any specific monitoring of the use of fixed-term contracts in higher education, but HEFCE will be reporting to the Department on the wider issue of workforce trends in the new year, and the Research Careers Committee (chaired by Sir Gareth Roberts and led by the Office of Science and Technology) will monitor trends relating to research careers, which will include the impact of the Fixed-Term regulations.

11. *Please could you provide information on any discussions between HEFCE and Vice Chancellors on the subject of short-term contracts and good governance? (Q 217)*

HEFCE has regular discussions with Vice-Chancellors on a variety of issues including those relating to good governance. In particular, HEFCE supports a Leadership, Governance and Management Fund which raises awareness on good practice in the sector and enables it to be disseminated widely, amongst all institutions. HEFCE is also involved in wider discussions on governance issues with a range of sector bodies such as the Committee of University Chairmen (CUC). It has recently supported CUC's production of a new edition of its Guide for Members of Higher Education Governing Bodies in the UK and a study of good governance practices in the UK. The specific question of contracting arrangements will often be a detailed matter for individual institutions, though any impact this has on good governance could be addressed by the sector through these initiatives.

12. *What consideration has Government given to offering bursaries for undergraduates studying shortage subjects, such as chemistry and maths? (Q 232)*

We have no present plans to offer subject-based bursaries to undergraduates. Government as an employer does offer incentives to graduates who join the teaching profession in maths, science and technology, (among other shortage subjects); higher education institutions (HEIs) are considering what bursaries and financial support they offer to undergraduates if charging higher variable fees, or may offer a reduced or zero fee level to students; and bodies such as the Institute of Physics have announced that they will offer bursaries to physics students. Given the variety of university courses on offer, combining different subjects in different ways, and the numbers of students on such courses already, for Government to select students and courses would be difficult, and there would be considerable risk of deadweight. For example, the latest report published by Universities UK, drawing on data from the HE statistics agency, shows that in 2001–02 (the latest figures quoted) a total of 66,845 students enrolled in the physical sciences (of whom 19,085 are in chemistry) and 21,800 in the mathematical sciences. We believe that HEIs are best placed to decide whether to offer bursaries to students for particular courses and our plans as set out in the Science and Innovation investment framework offer a better way forward.

13. *Why did it take from May 2003 until October 2004 for the Science Review Directorate to complete its review of DCMS? How long do you expect future reviews to take? How are you modifying your approach to the reviews in the light of your experiences with DCMS?*

This was the first review of its kind (not just in the UK) and we have therefore been breaking new ground. Although it was announced in May 2003, assembling the new team and firming up the review process meant that the review did not actually get underway until August 2003. We then found that each stage took longer with DCMS than we had expected—and they were not stages that overlapped.

Each review will be tailored to getting value out of the process for each Department and Government more widely, and that will be the main driver—not timescales. However, we anticipate future reviews taking around 10 months to complete. The scoping phase of the next review (of the Health and Safety Executive) is underway and the third review, of the Department for Environment, Food and Rural Affairs (Defra) will start in January. Future reviews of other Government departments are in preparation.

We have reviewed the process used for the DCMS study, learned lessons and we now have clearer and tighter project management. It is intended that all the major science-using departments will have been reviewed in the next three to four years and this will require us to review three or four a year. In order to achieve this, greater resources are being deployed and we will use consultants to undertake most of the fieldwork.

December 2004
