



House of Commons
Science and Technology
Committee

Research Council Support for Knowledge Transfer

Third Report of Session 2005–06

Volume I



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**Research Council Support
for Knowledge Transfer**

Third Report of Session 2005–06

Report, together with formal minutes

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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 Innovation and its associated public bodies.

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Summary

This inquiry represents the first thematic scrutiny of Research Council activity. We found that the Research Councils have an important role to play in adding value to research supported across the UK and that there is general support for the knowledge transfer schemes they have implemented. We remain convinced that the main priority of the Research Councils should be in the support of basic research and that their knowledge transfer agenda, whilst important, should not detract from this.

We found weaknesses in Research Council strategies for promotion of knowledge transfer. The view of knowledge transfer taken by some Councils is too narrow, with a focus on technology transfer and little attention paid to the wider issues, such as policy development. There is also a perception that the Research Councils are not closely attuned to research user requirements and that their attention is focused on informing stakeholders rather than consulting on stakeholder needs. In addition, there is a particular need for the Research Councils to enhance communication and engagement with the Regional Development Agencies and Small and Medium size Enterprises.

We found little evidence of Research Council co-ordination or sharing of best practice in knowledge transfer. Also, despite their clear remit to co-ordinate and harmonise, we have not seen that there has been any added value from Research Councils UK in this area. Whilst some Councils have a simple funding structure for knowledge transfer, in other cases, a high level of confusion has been created since there are so many schemes in operation. Also, whilst in some cases, the Research Councils have taken a strategic approach to increase the number of their staff with skills and expertise in knowledge transfer, others have not done so.

The Research Councils have published a set of performance assessment metrics. However, there is a danger that activity rather than output will be measured and that the activities of the research community may be influenced. Whilst we welcome the recent External Challenge of Research Councils knowledge transfer activities, this review failed to evaluate individual Research Councils knowledge transfer schemes due to lack of resources. Since the Research Councils conduct little internal impact analysis of their knowledge transfer schemes, it is difficult to see how they can effectively allocate funding to different knowledge transfer activities.

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 Innovation (OSI)¹ and its associated bodies. In the last Parliament, the Committee scrutinised Research Councils by a series of inquiries into each one. We have taken a different approach in this Parliament and this inquiry represents the first scrutiny of the Research Councils thematically. This inquiry, which was launched on the 1st December 2005, focused upon the effectiveness of the Research Councils' knowledge transfer activities with particular respect to: promotion of collaborative working between researchers and partners in industry, including in the creative industries and in Small and Medium size Enterprises (SMEs); stakeholder engagement and communication; results and performance management and; co-ordination between the Councils and the role of Research Councils UK (RCUK).

2. We were grateful to receive written evidence from a range of representatives from UK academic and industrial sectors. We also appreciated comprehensive memoranda from the Government, setting out policy for knowledge transfer, and from RCUK, who set out evidence in response to the main topics and questions identified above. The RCUK memorandum also contained supplementary views from each of the Research Councils.

3. We held three oral evidence sessions during this inquiry:

- i. On the 15th March 2006, we took evidence from the Director General of the Research Councils, Professor Sir Keith O'Nions and from a separate panel representing the academic sector: Professor Christopher Snowden, Vice-Chancellor, University of Surrey; Professor Diana Green, Vice-Chancellor, Sheffield Hallam University; and Dr Bob Bushaway, University of Birmingham, representing the Association for University Research and Industrial Links (AURIL);
- ii. On the 29th March 2006 we took oral evidence from an External Challenge Panel established by the Research Councils to examine their knowledge transfer activities: Professor John Murphy, Head of University Partnerships, BAe Systems (Panel Chair); Ms Barbara Doig, Scottish Executive; and Professor Richard Brook OBE, ex-Chief Executive of the Sira Group of Companies. We heard from a separate panel representing the industrial sector: Sir John Chisholm, Executive Chairman, QinetiQ Group plc; Dr Malcolm Skingle, Director, Academic Liaison, GlaxoSmithKline; Tony McBride, Confederation of British Industry (CBI); and Dr Ian Ritchie, Technology Entrepreneur, Coppertop; and
- iii. On the 19th April, we held an oral evidence session with Professor Philip Esler, Chief Executive of the Arts and Humanities Research Council (AHRC); Professor Ian Diamond, Chief Executive of the Economic and Social Research

¹ The Office of Science and Innovation (OSI) was created on 3 April 2006, by merging DTI's Innovation Group (IG) into the previous Office of Science and Technology (OST).

Council (ESRC) and Chair of the RCUK Executive Group; Professor John O' Reilly, Chief Executive of the Engineering and Physical Sciences Research Council (EPSRC); and Professor Keith Mason, Chief Executive of the Particle Physics and Astronomy Research Council (PPARC).

We are grateful to all those who gave oral evidence during the inquiry. Transcripts of the oral evidence sessions are published alongside this report, together with written evidence submitted to the inquiry.

2 Background

The current situation

4. The UK has a strong and highly productive research base, recognised as excellent in its production of “pure” research outputs such as publications and citations. This has been recently confirmed by a DTI study into the outputs and outcomes from UK science, which showed that the UK produces 9 per cent of the world’s scientific papers and has a 12 per cent share of world citations.² However, historically, the UK has had difficulty in converting this established strength in basic science into commercial success.³ The Government has acknowledged this stating that “the UK is strong in research but needs to be more effective at translating the products of research into economic and social benefits”.⁴

5. Difficulties in converting the UK established strength in basic science into commercial success have been attributed, primarily, to a decrease in overall spending on research and development (R&D) in the UK. However, measurement of success in innovation is complex, since innovation in the academic sector must include consideration of factors such as numbers of spin-out companies formed and income generated from patents and licences. Statistics and international comparisons are to be treated with care, for example, although UK institutions create more spin-out companies than the US, more of these spin-outs fail.⁵ It has also been shown that UK institutions perform less well than the US in obtaining patents and that, although UK institutions attain more licences when compared to the US, they have far fewer licences which actually yield income.⁶ The UK also lags behind many of its European Union neighbours in the more robust innovation performance indexes compiled by the EU Community Innovation Survey.⁷

Government action

6. The Government has placed a major emphasis on research as a driver of economic growth and, through successive spending reviews, has more than doubled the science budget to £3.4 billion by 2007/8 (since 1997). The Government has also recognised the importance of innovation (the successful exploitation of new ideas) and rightly asserted that, to thrive in the competitive global economy, successful nations will be those that can “compete on high technology and intellectual strength, attracting the highest-skilled people

2 Department of Trade and Industry (DTI), Office of Science and Technology (OST), *PSA target metrics for the UK research base*, December 2005

3 Richard Lambert, *Lambert Review of Business-University Collaboration*, December 2003, chapter 2, para 2.1

4 Ev 49

5 UK University Commercialisation Survey: Financial Year 2002, p 7, www.auril.org.uk/publications/

6 As above

7 European Commission, Commission Staff Working Paper, *European Innovation Scoreboard 2004: Comparative analysis of innovation performance*, November 2004, SEC(2004) 1475

and the companies which have the potential to innovate and to turn innovation into commercial opportunity”.⁸

7. Knowledge transfer is an essential component of innovation. It is defined by the Government as “about transferring good ideas, research results and skills between universities, other research organisations, business and the wider community to enable innovative new products and services to be developed”⁹ The Government’s aim is to “promote the transfer of knowledge generated and held in Higher Education Institutions (HEIs) and Public Sector Research Establishments (PSREs) to the wider economy to enhance economic growth”¹⁰ It has allocated approximately 3 per cent of the science budget (over £111 million for the period 2006–07) to knowledge transfer as a contribution toward achieving this goal. The Government has also, in recent years, undertaken a series of reviews, reports and policy initiatives to support the competitiveness of the UK as a knowledge-based, innovation-driven economy and to determine how its knowledge transfer agenda could be best achieved. These include:

- i. The Lambert Review of Business–University Collaboration:¹¹ in 2002–03 the Government commissioned Richard Lambert, former editor of the Financial Times, to undertake an independent review of business-university collaboration. Lambert published his final report in December 2003 and the Government responded in 2004 as part of the ten year Science and Innovation Investment Framework;
- ii. The DTI Innovation Report: in December 2003, the Government also published the DTI Innovation Report, *Competing in the global economy: the innovation challenge*;¹²
- iii. Science and Innovation Investment Framework 2004–2014:¹³ In July 2004, the Government published for the first time a ten year investment framework for science and innovation. The Framework reiterated the commitment made in the Innovation Report to develop knowledge transfer plans and targets for each Council and to peer review Research Council support for knowledge transfer.¹⁴ In March 2006, the Treasury announced, with the budget, a consultation: *Science and Innovation Investment Framework 2004–2014: The Next Steps*, the conclusions of which are expected in late 2006; and
- iv. Gowers Review of Intellectual Property: In December 2005, the Government commissioned former Financial Times editor, Andrew Gowers to conduct this review which is aimed at finding the right balance between protecting

8 HM Treasury, Department of Trade and Industry and Department for Education and Skills, *Science and Innovation Investment Framework 2004–2014*, July 2005, p 1

9 “DTI definition of knowledge transfer”, www.dti.gov.uk/science/knowledge-transfer

10 As above

11 Richard Lambert, *Lambert Review of Business–University Collaboration*, December 2003

12 DTI, *Competing in the global economy: the innovation challenge*, December 2003

13 HM Treasury, Department of Trade and Industry and Department for Education and Skills, *Science and innovation investment framework 2004–2014*, July 2005

14 As above, para 1.20

Intellectual Property rights and encouraging innovation. The report is due in Autumn 2006.

8. To allow measurement of UK success in science and innovation on an international level, the Department of Trade and Industry (DTI) has set down a series of Public Service Agreement Targets (outputs) for the Science Budget:¹⁵

- Output 1: to maximise the impact of the investment of the Science Budget on maintaining and improving the UK's research base; and
- Output 2: to increase the contribution made to improving exploitation of the research base to meet national economic and public service objectives.

These new targets will become an integral part of the performance management system for the Research Councils and performance against targets will inform future Spending Reviews.¹⁶

The Research Councils

9. The eight UK Research Councils are independent public bodies responsible to the Department of Trade and Industry's Office of Science and Innovation. The Councils are funded through the Government's Science Budget and, together, currently manage a research budget of over £2.5 billion a year, rising to £2.8 billion in the period 2007–08,¹⁷ in support of research and research training in universities and research centres throughout the UK. Through RCUK, a strategic partnership between the Councils, they work together to “champion the research, training and innovation they support”¹⁸ The Government awarded over £7.5 million of the science budget knowledge transfer allocation (£111 million, 2006–07) for supporting Research Councils' knowledge transfer activities.¹⁹

10. The Research Councils each have specific knowledge transfer responsibility within their missions.²⁰ Whilst there are *sector specific* differences between the Research Councils, and additional responsibilities for CCLRC, ESRC and MRC, the basic remit is to: “advance knowledge and technology (including the promotion and support of the exploitation of research outcomes), and provide trained scientists and engineers, which have potential to contribute to the economic competitiveness of Our United Kingdom and the quality of life, through meeting the needs of users and beneficiaries (*specified industrial sectors*)” .²¹

15 DTI, *Science Budget Allocations 2005–06 to 2007–08*, May 2005, p 2

16 HM Treasury, Department of Trade and Industry and Department for Education and Skills, *Science and innovation investment framework 2004–2014*, July 2005, chapter 5, para 5.33

17 OST, *Breakdown of science budget allocations 2005–08*, www.ost.gov.uk/research/funding/budget05-08/full_breakdown.pdf

18 RCUK, *RCUK aim*, www.rcuk.ac.uk/

19 Ev 50

20 Ev 55

21 As above

The External Challenge Panel

11. RCUK stated, in its Delivery Plan of May 2005, that it would “develop common processes for each Council’s plans and KT [knowledge transfer] activities to be subject to external peer review through ‘*External Challenge*’”²² It appointed a panel to conduct this review towards the end of 2005. The panel consisted primarily of industrialists and members were put forward by each Research Council. RCUK appointed the Panel Chair and commissioned Partnerships UK to write an independent report. Partnerships UK is a Public Private Partnership with the public sector mission: to support and accelerate the delivery of infrastructure renewal, high quality public services and the efficient use of public assets through better and stronger partnerships between the public and private sectors.²³ Panel Chair and Members offered their time and services to this review on an unpaid, voluntary basis.

12. The aim of the External Challenge was to provide the Research Councils and OST with an external assessment of each Council’s portfolio of knowledge transfer activities and future plans in this area. The panel was, therefore, directed to take account of the breadth of research undertaken by each Council, the characteristics of their user communities and the resources available. The Panel was also asked to look into the level of Research Council interaction with business and to identify examples of good practice in knowledge transfer and areas for further development. The Panel reported on the results of the External Challenge in May 2006.²⁴ We are grateful to RCUK for providing us with the External Challenge report prior to publication.

22 RCUK, *RCUK Delivery Plan*, p 35

23 Partnerships UK, *Partnerships UK mission*, www.partnershipsuk.org.uk/aboutpuk/overview.asp

24 External Challenge Panel, *Independent External Challenge Report to Research Councils UK, “Knowledge Transfer in the Eight Research Councils”*, April 2006, www.rcuk.ac.uk/documents/exchallenge.pdf

3 Promoting knowledge transfer

Introduction

13. Publicly-funded support for innovation is managed through a number of organisations and bodies and via numerous different schemes. We sought to examine the Research Councils' role in supporting knowledge transfer and the effectiveness of their efforts to do so.

Government support for knowledge transfer

14. There is widespread support for Government activity to fund and promote knowledge transfer. For example, AstraZeneca told us that “the value of the total research investment made by the OST [Office of Science and Technology] will not be realised unless KT [knowledge transfer] is highly promoted, rigorously pursued and adequately funded”.²⁵

15. The Government told us that “Research Council activity needs to be seen in the wider context of a range of Government support for innovation”.²⁶ Main support routes for Government funded knowledge transfer are shown in Figure 1 and include:

- A Investment through the Department for Education and Skills (DfES) and Higher Education Funding Council for England (HEFCE) to the Higher Education Innovation Fund (HEIF), which supports higher education institutions (HEIs) in knowledge exchange and productive interactions with business, public sector organisations and the wider community²⁷ The DfES HEIF contribution is approximately £20 million for 2005/06.²⁸
- B Investment through the DTI and OSI to:
 - i. Contribute toward the HEIF fund.²⁹ DTI expenditure on HEIF is approximately £60 million for 2005/2006;³⁰
 - ii. Support Research Council knowledge transfer activities. The Government awarded over £7.5 million of the science budget knowledge transfer allocation for supporting Research Council's knowledge transfer activities;³¹
 - iii. Support knowledge transfer from Public Sector Research Establishments (PSRE) through the PSRE fund.³² The PSRE fund was worth approximately

25 Ev 100

26 Ev 49

27 HEFCE, *Higher Education Innovation Fund*, www.hefce.ac.uk/reachout/heif/

28 OST, *OST: Knowledge transfer/exploitation funding*, 2006

29 DTI, *Science Budget Allocations 2005–06 to 2007–08*

30 DTI, *Departmental Report, 2005*, Annex B, Table B1: Request for Resources 2, p 195.

31 DTI, *Science Budget Allocations 2005–06 to 2007–08*

32 As above

£10 million in 2005/2006;³³ Provide funding to the DTI technology programme (overseen by the Technology Strategy Board) to support business-relevant collaborative R&D programmes and knowledge transfer networks.³⁴ The Technology Strategy Board has been allocated £320 million for three years (2005 – 2008);³⁵ and

- iv. Give support to Regional Development Agencies (RDAs) for promotion of business innovation as part of their Regional Economic Strategies. Investment in regional science and innovation by RDAs will reach £360 million in 2005–06.³⁶

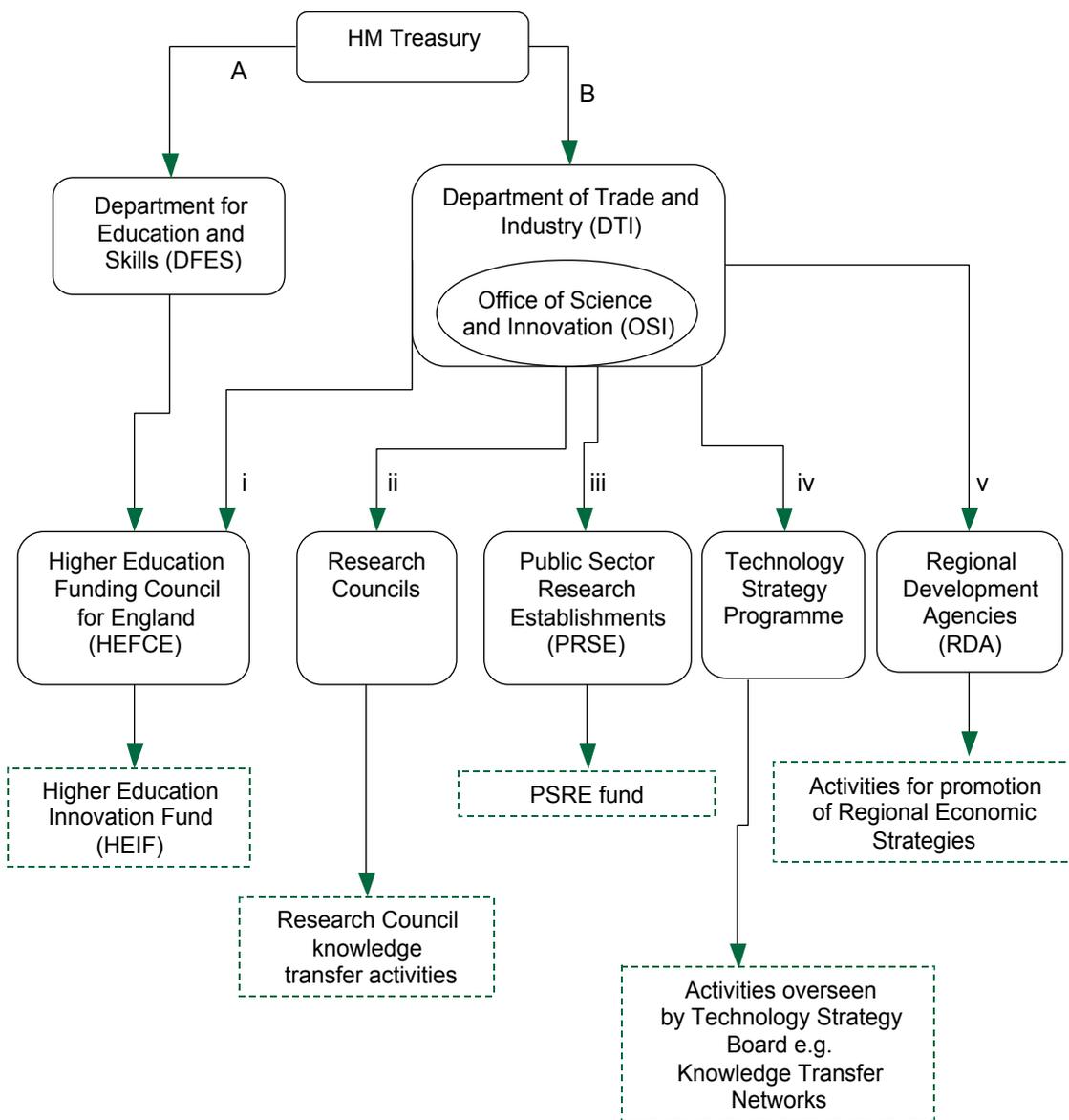
33 DTI, *Departmental Report, 2005*, Annex B, Table B1: Request for Resources 2, p 195

34 DTI, *DTI Technology Programme*, www.dti.gov.uk/innovation/tech-priorities-uk/about_the_programme/index.html

35 DTI, *Succeeding through innovation*, November 2005

36 HM Treasury, Department of Trade and Industry and Department for Education and Skills, *The ten-year Science & Innovation Investment Framework Annual Report 2005*, chapter 2, para 2.7

Figure 1



16. Other Government mechanisms to support innovation include: tax credits for large and small businesses (R&D contracted out to universities is eligible for tax credit, thus reducing the net cost to businesses); the Science Research Infrastructure Fund (SRIF3) which awards research capital funding on condition that HEIs develop greater access to facilities for business; innovation support schemes e.g. Knowledge Transfer Partnerships and Global Watch. Support is also given to “Science Cities”, a concept designed to bring together Government, universities and industry at a local level and Government-supported venture capital measures e.g. Enterprise Capital Funds.³⁷ The UK also accesses funding in support of knowledge transfer and innovation from the European Union’s Framework Programme.³⁸

37 Ev 51

38 Ev 52

Role of the Research Councils

17. The Research Councils are the main public investors in fundamental research in the UK and manage a significant proportion of the knowledge transfer budget. Although their main role is to fund research on the basis of excellence and research training, they recognise that they have a “distinctive role to play in ensuring that research outcomes are fully exploited, to maximise the effect of successive increases in Science Budget funding for research activities”.³⁹

18. We found good consensus that the Research Councils have a role in promoting knowledge transfer. QinetiQ said that “the RCs [Research Councils] should be made fully accountable for generating and adding value to integrated portfolios of research that either advance the frontiers of purer science and knowledge or enhance national competitiveness through business”.⁴⁰ We also heard from Professor Diana Green, representing Universities UK, that “it is entirely right and proper that the Research Councils should be concerned about the practical applications of the research that we are all being funded for”.⁴¹ However, we also heard from Dr Ian Ritchie who said that the “Research Councils ought to concentrate on what they do best, which is getting excellent research in the UK”.⁴²

19. Professor Sir Keith O’Nions approved of a fundamental role for the Research Councils in supporting knowledge transfer, telling us that although the “central role for Research Councils is the creation of new knowledge in universities and in research institutes”, they also have an important role in supporting knowledge transfer.⁴³ Furthermore, Sir Keith told us that all major sources of knowledge transfer funding “have a very important role to play” since “if one does not play the game, the efforts of another may be somewhat reduced in its effectiveness”.⁴⁴ **The Research Councils have an important role to play in adding value to the research supported across the UK and we welcome the Research Councils’ commitment to support knowledge transfer.**

Co-ordination of UK support for knowledge transfer

20. Although there are many sources of funding for knowledge transfer across the UK, the co-ordination between them has been questioned. Professor Snowden, Vice Chancellor of the University of Surrey, told us of “a high degree of disconnect between the very many different groups involved [in knowledge transfer]”⁴⁵ and we heard from the Institute of Physics of the importance that “all publicly-funded research reflects a coherent national strategy, rather than the fragmented set of strategies that we have at present”.⁴⁶ The Confederation for British Industry (CBI) also told us of “concerns over the nature of the

39 HM Treasury, Department of Trade and Industry and Department for Education and Skills, *Science and Innovation Investment Framework 2004–2014*, chapter 5, para 5.32

40 Ev 134

41 Q 67

42 Q 153

43 Q 3

44 Q 5

45 Q 69

46 Ev 125

UK's approach to public support for science, R&D and innovation, particularly the fact that it is characterised by this high number of small schemes each distributing a small portion of the pot".⁴⁷ It believes that the Government should "investigate opportunities for merging funding schemes operated by the major funders of the research base (including the Research Councils) around agreed national priorities".⁴⁸ Criticism of UK co-ordination in Research and Development is not new. The House of Lords Science and Technology Select Committee previously recommended that "the Government should establish a forum for the Office of Science and Technology (including the Research Councils), Regional Development Agencies (RDAs) and other key players, that meets regularly to address the impact of and synergy between national and regional SET [Science, Engineering and Technology] investments and, as far as possible, harmonise them".⁴⁹

21. There were specific complaints with regard to co-ordination between RDAs and Research Councils. The Lambert review emphasised that regional links between business and academia were important for promoting innovation".⁵⁰ RDAs are therefore increasing their support of business innovation as part of their Regional Economic Strategies, and have received significant levels of funding toward their science and technology activities (£360 million over 2005–06).⁵¹ Within the Research Councils there is good understanding of UK research strengths, whilst RDAs have expertise in regional business strengths and requirements. We agree with Professor Diana Green, Vice Chancellor of Sheffield Hallam University, that "there is a great opportunity for some joined up thinking".⁵²

22. Professor Murphy, from BAe Systems and Chair of the External Challenge Panel, claimed that there is a general lack of expertise in knowledge transfer within RDAs. He told us that "for historical reasons, the Research Councils have evolved a very strong knowledge base, which the RDAs do not have".⁵³ The Campaign for Science and Engineering (CaSE) agreed, telling us that "some of the Regional Development Agencies [...] have clearly not yet fully understood their role in supporting the process of generating wealth from research"⁵⁴ GlaxoSmithKline (GSK) took this view a step further, saying that "current arrangements for the promotion of knowledge transfer by the Regional Development Agencies (RDAs) are not satisfactory" and that "there are real opportunities for the Research Councils to take a lead here".⁵⁵ Criticism of RDA expertise is not new to this inquiry. Indeed, we also have previously commented upon the "patchy nature of scientific expertise in RDAs".⁵⁶

47 Q 175

48 Ev 134

49 House of Lords, *Science and the RDAs SETting the regional agenda*, Fifth Report of the Select Committee on Science and Technology, Session 2002–03, HL Paper 140-I

50 Richard Lambert, *Lambert Review of Business-University collaboration*, Introduction

51 Ev 51

52 Q 69

53 Q 122

54 Ev 121

55 Ev 117

56 Fifth Report from the Science and Technology Select Committee, Session 2003–04, *Too little too late? Government Investment in Nanotechnology*, HC 56-I, p 71

23. The Research Councils were not concerned about their levels of engagement with RDAs, displaying a general acceptance of the situation. During his evidence, Professor O’Nions told us that “RDAs come in different shapes and sizes [and that] they have different amounts of money to invest”.⁵⁷ Professor Ian Diamond, Chief Executive of ESRC and current chair of the RCUK executive group, told us that because there is “a rich diversity amongst the RDAs”⁵⁸ one might “expect the degree of interaction with RDAs to be quite variable”.⁵⁹ Professor Diamond did, however, acknowledge the “enormous scope for a lot more to be done in the regions”⁶⁰ and that the Research Councils “really have to identify improved ways of working with the RDAs in this area”.⁶¹

24. We agree that there is variation in RDA capacity and expertise. However, we were disappointed not to obtain a clear view of how the Research Councils intend to enhance co-ordination with the RDAs or how they might benefit from each others knowledge or experience. Momenta, a division of the innovation business AEA Technology plc, told us of “the very low awareness in industry [...] of what knowledge is being generated by the research base and how it might be exploited to competitive advantage of companies”.⁶² Since the Research Councils possess good understanding of the research base and of the knowledge created, they could consider sharing this information to help RDAs to build a knowledge base of the expertise within their regions. For example, this could follow a similar line to Yorkshire Forward who, in attempts to increase knowledge transfer within the Yorkshire and Humber region, recently launched KnowledgeRICH, an online and telephone service designed to bring businesses requiring input into products or problems and academia together.

25. We are not convinced that measures put in place to facilitate national co-ordination of knowledge transfer are sufficient and we believe that there is a need for co-ordination between all UK funders of knowledge transfer to be enhanced. We recommend that the Government takes the necessary steps to ensure a co-ordinated knowledge transfer strategy. We recommend that the Research Councils lead the development of a strategy through which engagement between all organisations currently involved in support of knowledge transfer can be enhanced. We consider that there is a particular need for increased engagement between RDAs and the Research Councils. We call on the Research Councils to develop effective working relationships with all RDAs, strengthening links where necessary, disseminating good practice and supporting RDAs in building up their expertise.

57 Q 25

58 Q 221

59 Q 25

60 As above

61 Q 221

62 Ev 123

4 Research Council strategy

Introduction

26. Since this inquiry aimed to examine the effectiveness of Research Council support for knowledge transfer, it was important that we determine how the Research Councils themselves define and view this area.

27. Knowledge transfer, and the processes involved in the transfer of knowledge are not well understood. There is no single, universally accepted, definition of ‘knowledge transfer’ and the term is often used interchangeably with ‘technology transfer’, ‘knowledge exchange’ and ‘translation’. CaSE told us that “neither the political community nor the science and engineering community can agree on a terminology for the various activities that form the focus of the Committee’s inquiry”⁶³ and we heard from the Centre for Sustainable Urban and Regional Futures that “the ‘missing middle’ in KT [knowledge transfer] is the expectations placed upon all stakeholders in research without a mutual understanding being developed”.⁶⁴

The Research Councils view of knowledge transfer

28. As acknowledged by Professor O’Nions, knowledge transfer “means somewhat different things to different people”.⁶⁵ The lack of a common definition for knowledge transfer can be a problem since it may result in blurred understanding of the processes involved. We were therefore encouraged to see that, according to RCUK, the Councils have agreed a shared understanding of knowledge transfer: “The UK Research Councils seek to accelerate the two-way flow of people and ideas between the research environment and wider economy, and thereby contribute to national prosperity, the quality of life of UK citizens, and cultural enrichment of our society. Knowledge Transfer encompasses the systems and processes by which knowledge, expertise and skilled people transfer between the research environment (universities, centres and institutes) and its user communities in industry, commerce, public and service sectors”.⁶⁶

29. This view appears to be a wide understanding of knowledge transfer which includes areas not only relevant to exploitation for commercial benefit but also for cultural enrichment and the quality of life, including in the public and service sectors and which encompasses knowledge transfer in policy development. We were therefore, somewhat surprised to learn that the individual Research Councils exclude certain areas from this view of knowledge transfer. Professor Diamond told us that, in the view of ESRC, “the definition of knowledge transfer would not include the way we look at Science in Society”.⁶⁷ Professor Diamond did, however, recognise that there is a distinct relationship

63 Ev 121

64 Ev 111

65 Q 1

66 Ev 55

67 Q 201

between issues important to science and society and knowledge transfer”.⁶⁸ We recognise that there are grey areas and that knowledge transfer may overlap and feed into many Research Council funding schemes. We consider however, that greater clarity is required since it was not initially apparent that the Councils exclude certain areas from their understanding of knowledge transfer or indeed, what they do consider relevant. **We welcome efforts to develop a clear, cross-Council understanding of what the term ‘knowledge transfer’ should mean to the research community. We urge the Councils to clearly communicate what is and isn’t included within their view of knowledge transfer.**

Technology push and pull

30. The Government’s ten year Science and Innovation Investment Framework noted the importance of both “the measures being taken by Research Councils to improve the uptake of technology coming from the science base (‘technology push’) and the efforts by the DTI to promote demand for new technology in the business community (‘technology pull’)”.⁶⁹ However, as pointed out by the Lambert Review, “innovation processes are complex and non-linear. It is not simply a question of researchers coming up with clever ideas which are passed down a production line”⁷⁰ and it is now widely accepted that, for beneficial knowledge transfer to occur, production of results must be appropriately coupled with what users actually require. We heard similar views expressed by the CBI who stated that “successful knowledge transfer activities are those that are rooted in, and reflect, user needs. This is not solely about technology push. It also requires customer pull – the market influencing the science base”.⁷¹

31. The Institute of Physics was also concerned that “there is too much encouragement of technology push and not enough user pull at the start of research” telling us that “this leads to scattered and fragmented activity without significant and complete outcomes”.⁷² The External Challenge Panel took this view a step further saying that there is “a strong perception in the end-user community that the percentage of funding steered by end-user needs is far too small with beneficial impact too dependent on serendipity” and that “Research Council funding schemes are heavily biased to facilitating academic push rather than established business pull”.⁷³

32. In his evidence to us, Professor O’Reilly was reluctant to accept criticism that the Research Councils are too focused on ‘technology push’, explaining that there is “a chain right the way from the knowledge creation generation stage, identification stage, through to exploitation and that Research Councils rightly are focused more at the front end of that rather than at the back”.⁷⁴ We have some sympathy with Professor O’Reilly’s view since, as

68 Q 201

69 HM Treasury, Department of Trade and Industry and Department for Education and Skills, *Science and innovation investment framework 2004–2014*, July 2005, chapter 5, para 5.35

70 Richard Lambert, *Lambert Review of Business-University Collaboration*, December 2003, chapter 1, para 1,24

71 Ev 130

72 Ev 125

73 External Challenge Panel, *Independent External Challenge Report to Research Councils UK, “Knowledge Transfer in the Eight Research Councils”*, April 2006, pp 2-3 (overarching finding)

74 Q 272

the main investors in public research, it seems natural that the Research Councils should focus primarily on front end of the research chain. **Whilst we accept that the Research Councils may sit at the ‘push’ end of the research chain, we are concerned by the perception that they are not interested in the requirements of industry. We urge them to address this perception and to ensure that user requirements are fully considered when determining funding priorities.**

Vision for knowledge transfer

33. If UK competitiveness is to be boosted through innovation then it is essential that a clear vision and strategy for improving the rate and success of knowledge transfer is firmly in place. Each of the Research Councils published Delivery Plans as part of the 2004 Spending Review (SR2004) allocation process, setting out funding priorities and outlining the activities that they intend to undertake over the period 2005–06 to 2007–08.⁷⁵ According to RCUK, the Delivery Plans were developed following consultations with a “broad range of stakeholders” and were “written in the context of an OST Strategy for the Science Base, which itself draws on the Government's Science & Innovation investment framework 2004–2014”.⁷⁶ The Delivery Plans also take account of each Research Councils’ own visions and strategic priorities. Within these plans the Councils have indicated their specific visions for knowledge transfer, for example, as demonstrated by the EPSRC Delivery Plan, section 9 “Delivering growth through innovation”.⁷⁷

34. In their report, the External Challenge Panel expressed “concerns about the apparent lack of long term vision (and goals) for KT at the highest strategic level”.⁷⁸ When questioned further, Professor Brook explained that the Panel considered that their own “view of knowledge transfer [was] rather wider than the view which sometimes you find in Research Councils”. Specifically, Professor Brook explained that they “felt there was a role for the informing of public policy and a range of other stakeholders as well as just business” but that the Research Councils were focused on “a conventional approach to technology transfer as opposed to knowledge transfer” and that “the community which is being addressed is probably still largely business”.⁷⁹ We agree with this opinion since it is apparent that a number of the Research Councils Delivery Plans focus heavily on knowledge transfer for exploitation, directed at the business community, with little attention paid toward requirements for public policy and other stakeholders, for example, the Biotechnological and Biological Sciences Research Council (BBSRC) and PPARC.

35. In their initial response to us on the content of the External Challenge report, we found RCUK reluctant to accept criticism, telling us that they found such comments “surprising, given that each Council has an explicit responsibility for knowledge transfer in their missions, and that all have clear, top-level objectives in their delivery plans”.⁸⁰ However,

75 Research Councils UK: Delivery Plan, www.rcuk.ac.uk/press/20050526deliveryplan.asp

76 As above

77 EPSRC, *EPSRC Delivery Plan*, www.epsrc.ac.uk/CMSWeb/Downloads/Publications/Corporate/DeliveryPlan.doc

78 External Challenge Panel, *Independent External Challenge Report to Research Councils UK, “Knowledge Transfer in the Eight Research Councils”*, April 2006, para 4.2

79 Q 109

80 Ev 166

during oral evidence, we found Professor Mason, Chief Executive of PPARC, slightly more forthcoming, acknowledging that “the whole point of the report was to learn from it and if the report concludes that there is no long term strategy [then] we have to take note of that”.⁸¹ We have some sympathy with the Research Councils on this point since the External Challenge Panel did not indicate clearly what they had meant in the initial report. We actually consider that this issue results from a difference of opinion with respect to what knowledge transfer should encompass as opposed to lack of vision in this area. **We welcome the effort made by the Research Councils to set out future knowledge transfer priorities within their Delivery Plans. We find that some of the Research Councils have taken a narrow approach and that consequently, their Delivery Plans do not reflect the wider view of knowledge transfer.**

Engagement with stakeholders

36. Each Research Council has a diverse set of stakeholders and users. These range from large multinational companies to Small and Medium size Enterprises (SMEs) and from policy makers in Whitehall and the regions to the National Health Service (NHS), the Met Office and museums and galleries. According to RCUK, each Council has developed its knowledge transfer strategy and approach in consultation with its major business and research user groups, seeking input through a wide range of mechanisms including:

- business and user representation on each governing Council;
- business or user led high-level advisory groups e.g. EPSRC’s User Panel or BBSRC’s Bioscience for Industry Panel;
- business and user membership of Council peer review colleges and peer review panels;
- funders forums;
- concordats with Government Departments;
- regular dialogue with companies, CBI and trade associations; and
- seminars, workshops and conferences with user groups.⁸²

Improving links

37. The Lambert Review commented on “a view in business that Research Councils taken as a group could do more to build collaborative links with business”.⁸³ In the evidence submitted to this inquiry, we found a high level of agreement with Lambert’s views and noted significant criticism of Research Council and RCUK efforts to engage stakeholders. For example, the CBI told us that “currently, engagement and communication with business users would appear to be patchy, with some Research Councils seemingly more

81 Q 212

82 Ev 57

83 Richard Lambert, *Lambert Review of Business-University Collaboration*, December 2003, chapter 6, para 6.33

focused and successful in their efforts to engage stakeholders”.⁸⁴ QinetiQ told us that Research Council “communications are predominantly to inform rather than to listen or gather information” and they have relatively little consultation with users.⁸⁵ We also heard specific criticism of RCUK. For example, from GSK, who said that RCUK’s “ability to interact with all of the Councils in a collective manner, through RCUK, for example on the promotion of good practice, is somewhat limited” and that “RCUK does not appear to be particularly proactive in seeking input from industry”.⁸⁶ The External Challenge Panel took these claims a stage further, reporting that they found end-users ‘marginalised’ in the funding process, only engaged once funding decisions had been made.⁸⁷

38. We found the Research Councils defensive and reluctant to acknowledge criticism from business. RCUK challenged the view of the External Challenge Panel telling us that “the Councils refute entirely the findings that end-users are marginalised in the funding process and only engaged once funding decisions are taken”.⁸⁸ Professor O’Reilly said that for each company where we [this Committee] had received a negative comment, he would be able to go and find someone to say “I have got experience of really good engagement”.⁸⁹ Professor Diamond took a more constructive approach telling us that the Research Councils “are always looking to develop and improve our activities in every area” and that one of these areas is communication. Professor Diamond followed on by saying that the Research Councils consider it important to take the responses that have come to this Committee, viewing them as an opportunity for reviewing their activities.⁹⁰ **We are concerned by negative perceptions of Research Council communication and engagement with their stakeholders. We urge the Research Councils to take steps to engage business users more effectively. It is important that the Councils clearly consult and act upon the views of all stakeholders, addressing the perception that they are only interested in informing them.**

SME engagement

39. In addition to general concerns with respect to stakeholder engagement, we became aware of specific problems associated with Small and Medium size Enterprise (SME) engagement in collaborative research projects. The Institute of Physics noted that “for small and medium sized companies it can be difficult to engage universities in collaborative high risk innovation projects. To this end there could be improved co-ordination of linked projects within the Research Councils together with better integration between the strategies of the Research Councils and Government departments”.⁹¹ However, when asked how aware the Research Councils are of the problems faced by SMEs, we were told in oral evidence by Dr Ian Ritchie that he does not “think they are very responsive at all” telling us

84 Ev 130

85 Ev 135

86 Ev 114

87 External Challenge Panel, *Independent External Challenge Report to Research Councils UK, “Knowledge Transfer in the Eight Research Councils”, April 2006 p 3 (key findings)*

88 Ev 166

89 Q 272

90 Q 271

91 Ev 127

that bodies, such as the Research Councils, rarely seem to ask SMEs what it is they want.⁹² Professor Brook of the External Challenge Panel took a slightly more positive view telling us, when asked about how well the Research Councils engage with SMEs, that “the Research Councils are improving but they are still looking for ways of interacting with the SME community”.⁹³

40. Professor Diamond told us that “engaging with the SMEs is an important priority” and that “we have brought SMEs into the ESRC, into panels, and also researched on SMEs and the way in which they can work most effectively in this area”.⁹⁴ **We believe that there is a need to enhance SME-Research Council engagement considerably. We recommend that the Research Councils are more proactive in their engagement with SMEs, recognising that very distinct challenges must be overcome if SMEs are to be successfully involved in knowledge transfer, for example in collaborative work with universities.**

Balancing priorities

41. Knowledge transfer is increasingly a priority for the Research Councils. During this inquiry we have noted concerns that focus on promotion of knowledge transfer could result in diversion of funds from other Research Council priorities and that there is the potential for the balance of funding within the Councils to be affected. In particular, we noted concerns with respect to balances between i) research funding and funding allocated toward specific knowledge transfer activities and ii) funding for basic and applied research.

Allocation of resources

42. We became aware of a widespread perception in the scientific community that increased funding for knowledge transfer may result in reduction of funding in support of basic research. The Research Councils account for over 80 per cent of Science Budget expenditure (approximately £2.8 billion⁹⁵) and award most of this money on the basis of scientific excellence, through peer review. The Research Councils, therefore, not only play a major role in supporting the UK research base financially, but act as a quality control mechanism ensuring that only research of the highest quality is supported. We were, therefore, concerned to hear apprehension from the scientific community that increased support for knowledge transfer may result in diminished funds for research. The 1994 Group of universities told us that “there remains an overriding concern that there will be no new money for knowledge transfer awarded to the Research Councils forcing them to divert sums away from basic research grants. Knowledge transfer cannot happen unless the basic research is being done in first place”.⁹⁶ CaSE agreed with this point arguing that “without very substantial new money and a clear protection of [the Research Councils’] role in funding fundamental research, we should not even consider them as candidates for

92 Q 177

93 Q 138

94 Q 273.

95 HM Treasury, Department of Trade and Industry and Department for Education and Skills, Department of Health, *Science and innovation investment framework 2004–2014: next steps*, March 2006, chapter 3, box 3.1.

96 Ev 127

the role of co-ordinating knowledge transfer”.⁹⁷ The University of Surrey is also concerned that the “Research Councils do not become too diluted from their primary mission of funding long-term research”.⁹⁸

43. Since the application of research is itself a knowledge transfer activity, there is significant overlap between funding for activities which may *feature* knowledge transfer (such as funding for research projects) and funding which has been *specifically* dedicated to knowledge transfer (such as the RCUK business plan competition). It is important to note that funding which has been specifically dedicated to knowledge transfer is, as Professor Mason, Chief Executive of PPARC, told us “still a very small fraction of the total budget” and that, as in the case of PPARC, only about one per cent of Research Councils budget is spent on “direct” knowledge transfer issues.⁹⁹ In contrast, Research Council spend on applied or collaborative research, which is consequently directly related to knowledge transfer, is at significantly higher levels, for example as stated by Professor O’Reilly who believes that “over 40 per cent of EPSRC grants have collaboration with business directly”.¹⁰⁰

44. We considered whether perceptions of risk to basic research funding could actually result from a lack of transparency with respect to Research Council expenditure or clear plans for future activities. AstraZeneca told us that they “find it difficult to obtain figures from each Research Council for its own spend on knowledge transfer”.¹⁰¹ We also heard from the Centre for Sustainable Urban and Regional Futures that “in terms of Research Councils, allocation of funding to knowledge transfer activities is often difficult to determine”.¹⁰² We have some sympathy with these views since we also have found it difficult to ascertain Research Councils’ spend on knowledge transfer activities, despite looking through a number of Research Council annual accounts and reports.

45. Although we accept that the Research Councils have been awarded dedicated funds through the science budget for knowledge transfer, and that the funds they give directly in support of knowledge transfer activities are actually relatively small, we are concerned by the perception that research funding is at risk. **The Research Councils knowledge transfer agenda, whilst important, should not detract from their main priority, the funding of basic research. The Research Councils should challenge the perception that research funding is at risk by clarifying and clearly communicating future financial allocations and plans for knowledge transfer.**

Basic versus applied research

46. In the past, the Research Councils have, in general, been responsible for funding basic research and industry has focused on supporting applied research. However, in the evolving research climate in which lines between research type and discipline are blurred,

97 Ev 122

98 Ev 105

99 Q 277

100 Q 217

101 Ev 100

102 Ev 108

the division between blue skies and applied research is often unclear. Not surprisingly, evidence from industry shows support for Research Council funding of applied research. For example, GSK told us that “the Research Councils should support the whole spectrum of research which underpins the UK science base, from “blue skies research” through to more applied research”.¹⁰³ We were also interested to hear from Professor Diana Green, of Universities UK, who told us that “it is entirely right and proper that the Research Councils should be concerned about the practical applications of the research that we are all being funded for”. Professor Green went on to say that “the argument [in her view] is about where that balance lies, particularly if the core issue is not the balance within that budget but the amount of funding that is available in general terms. If there is not enough to go round, it becomes much more important to argue about where the cut-off point is”.¹⁰⁴ QinetiQ, in active support of funding for applied research, took this view a step further telling us that “in promoting Knowledge Transfer, the RCs [Research Councils] should separate more clearly their funding streams for research which is truly original, leading edge and remote from immediate application, from research that is closer to exploitation” and that “they [the Research Councils] should ensure that applied projects have clear potential exploitation routes with proactive user involvement from the outset”.¹⁰⁵

47. When questioned on how the Research Councils view funding balances between basic and applied research, Professor Diamond told us that “we do not see a distinction across all the Research Councils between basic and applied, which is all, if you like, frontier research and all absolutely excellent, world-class research”.¹⁰⁶ Professor O’Reilly clarified this point by further indicating that the Research Councils “are about frontier research” and that he does not divide this between whether they should be involved in pure research or something that is the business of business.¹⁰⁷ **We remain convinced that the main role of the Research Councils is in the support of basic research. We accept that there is a blurred line between basic and applied research and we acknowledge Research Council use of the term ‘frontier research’ to describe the research they support. We still think there is value in use of the terms ‘basic’ and ‘applied’ research. The Research Councils need to take steps to ensure that they are recording sufficient information about the research they are supporting to enable them to rapidly respond to concerns about funding levels for basic and applied research.**

Embedding a knowledge transfer culture

48. We believe that increasing knowledge transfer in the UK is more complicated than simply funding schemes to help researchers exploit results once they have been obtained. Promotion of a more output-orientated culture across the UK is almost certainly required and, for such a culture to be embedded in the UK, researchers must be encouraged to become more aware of the benefits, to both the economy and society, that their research could generate.

103 Ev 114

104 Q 67

105 Ev 136

106 Q 223

107 As above

49. The Research Councils may be able to stimulate a more research-orientated culture through promotion of more stringent project management and monitoring of Research Council funded projects. The CBI told us that “there is a clear demand for project planning and post-project review on the part of the Research Councils as a foundation for a results-oriented culture. Such improvements are necessary to ensure the effective use of funding while at the same time ensuring that exploitable knowledge does not remain undeveloped”.¹⁰⁸ AstraZeneca told us that “Research Council funded projects in universities require more stringent project planning and project management than is the situation today in order to ensure that money is not wasted and potentially exploitable ideas and discoveries are not left undeveloped”.¹⁰⁹ Furthermore, AstraZeneca stated that “Evidence of robust timelines and clear success criteria for projects must be developed if we are to derive maximum economic benefit from the investment in research in the UK”.¹¹⁰

50. An additional mechanism for promoting a broader, results-orientated UK research community may be through encouraging consideration of the applicability of research at its initial stages, for example, within evaluation criteria on grant applications. QinetiQ told us that “funding criteria need to be adjusted to incentivise applied science”¹¹¹ and the 1994 Group, who agree with this view, stated that “KT [knowledge transfer] needs to be made an integral part of grant approval, monitoring and review process [...] we would support Research Council policies that required the anticipated or hoped-for knowledge transfer routes to be explored and articulated as an essential part of the funding application process”.¹¹²

51. Some of the Research Councils have already utilized grant applications as a mechanism for promoting consideration of knowledge transfer. PPARC for example, now requires people applying for grants to include a knowledge transfer plan within their proposal.¹¹³ However, we were told that there are no intentions to make this a universal approach across the Councils. Professor O’Nions informed us that there are no concrete plans for each Research Council to include knowledge transfer within peer review evaluation criteria and that “it is up to the peer review panels and the peer review process to look at that and make their judgments”.¹¹⁴

52. Whilst we were interested to hear of suggestions to include knowledge transfer within evaluation criteria, we are also concerned about the impact this may have. In particular, there appears to be a perception within the scientific community of bias towards proposals with good exploitation potential. This may, consequently, inhibit researchers from writing proposals which are, fundamentally, blue skies research with little or no obvious applicability. Dr Ian Ritchie told us “I think it is an appropriate question to ask but I absolutely do not think you should make the scientific decisions on whether there is a realistic answer to that question or not [the applicability of research or knowledge transfer

108 Ev 132

109 Ev 100

110 As above

111 Ev 135

112 Ev 127

113 Q 226

114 Q 19

potential]. You should be making the decision dependant solely on the science”.¹¹⁵ We were also interested to hear from Sir John Chisholm that there “should always be a component of any research programme which is entirely unlimited and purely blue sky for the purpose of civilisation” and that “when one wants to be blue sky, and purely focused on science for its own sake, that is an entirely legitimate thing for a country like the United Kingdom to do”.¹¹⁶ Finally, we were particularly concerned to hear from QinetiQ of a danger that “many industrial partners are ‘attached’ to proposals without sufficient commitment, involvement or expectation. The RCs [Research Councils] could therefore be misled into believing that their connection with exploitation of technology is greater than in practice it is”.¹¹⁷

53. Professor Mason was able to assure us that applications would still be awarded on the basis of excellence and that “you are not going to get anything funded on the back of a good knowledge transfer plan unless the science is great”.¹¹⁸ Professor Mason went on to explain that the aim of PPARC was actually “to embed the thinking about knowledge transfer right from the beginning”¹¹⁹ with additional value in that it could help “maximise the economic benefit by alerting [PPARC] to the potential for knowledge transfer in a particular programme” and thus enable PPARC to focus resources on the programmes likely to deliver the most economic benefit.¹²⁰ **We commend PPARC for its efforts to promote the importance of applicability and knowledge use to researchers. We urge PPARC to actively communicate its intentions where knowledge transfer is included within grant proposal evaluation criteria and to clearly convey the message that knowledge transfer will not determine the success of a grant application. We recommend that the other Research Councils consider this approach as a mechanism for embedding a more result-orientated culture.**

Performance measurement

54. If the Research Councils are to be successful in supporting knowledge transfer, then it is important that regular performance evaluation is undertaken to determine areas of accomplishment and for improvement. The publication, by Research Councils, of assessment metrics frameworks¹²¹ alongside their Delivery Plans is, therefore, strongly welcomed by the Committee. The assessment metrics are developed from the “Outputs Framework” contained within the Public Service Agreement Targets set down by the DTI alongside the Science Budget.¹²² The Research Council assessment metrics are a series of targets and milestones arising from the activities set out in each Councils Delivery Plan. According to RCUK, it is intended that data relating to the Outputs Framework will be published at the end of each financial year, commencing with 2005/06 (the first reports

115 Q 181

116 Q 182

117 Ev 135

118 Q 226

119 As above

120 As above

121 RCUK, *Research Council Delivery Plans and Scorecards*, RCUK, www.rcuk.ac.uk/deliveryplan.asp

122 DTI, *Science Budget Allocations 2005–06 to 2007–08*, p 2

should be made available in June 2006) and that progress against each Research Councils' Scorecard will be updated quarterly.¹²³ The assessment framework consists of Output 1 in which metrics for development of 'A healthy UK science and engineering base' are detailed and Output 2 which details factors required for 'Better exploitation'.¹²⁴ The objectives listed within the Output 2 framework vary between the Councils since, Professor Diamond told us, it was "agreed that there should be a matrix of metrics which reflected different aspects of the knowledge transfer agenda and that each Research Council would have individual metrics within that matrix which reflected their own activities and that recognised the breadth of activity".¹²⁵ We were particularly interested to determine how the Councils intended to use data from the metrics and were encouraged to hear from Professor Diamond that "we will be using this to monitor the directions that we are going in a set of activities, we will be using that to fine-tune and change some of our funding areas in terms of knowledge transfer".¹²⁶

55. Whilst we welcome the publication of measures to evaluate success in knowledge transfer, we are concerned about the appropriateness of the actual metrics used. Momenta told us that "what is being measured is largely *activity* rather than *outcomes*"¹²⁷ and we were also heard from Professor Snowden that he does "not think the metrics today are transparent enough to us all, as a starting point" and that they seem to be "relatively short term".¹²⁸ We were also concerned to receive views from QinetiQ that "those [metrics] considered, such as numbers of industry collaborations, patents and start-up companies, do not reflect accurately the value of interactions to users and may distort adversely the behavior of some research teams".¹²⁹ In response to apprehension regarding the effectiveness of the metrics for evaluating performance in knowledge transfer, Professor O'Reilly acknowledged that development of Output 2 metrics had been difficult since it "is new to try and get metrics on this".¹³⁰ Professor O'Reilly also indicated that the Councils had sought to "get things that were measurable in the qualitative as well as the quantitative sense".¹³¹ There is always a danger that metrics affect behaviour in unpredictable ways and that they may become a driver of activity rather than a measurement of success. This has been a recognised criticism of the Research Assessment Exercise, which has not adequately considered industrial collaboration and hence discouraged knowledge transfer.¹³² **We welcome the publication of Research Council performance assessment metrics but consider that refinement is required. We are particularly concerned that the Output 2 metrics, as they stand at present, measure activity rather than output and that they may influence the activities of the research community. We recommend that the Research**

123 RCUK, *Research Councils Publish Delivery Plans*, press release, 26 May 2005, www.rcuk.ac.uk/press/20050526deliveryplan.asp

124 RCUK, *Research Council Delivery Plans and Scorecards*, www.rcuk.ac.uk/deliveryplan.asp

125 Q 262

126 Q 267

127 Ev 124

128 Q 80

129 Ev 137

130 Q 264

131 Q 265

132 Q 84

Councils and RCUK regularly review the assessment metrics and the impact they are having, reporting back periodically.

Cross-Council co-ordination

56. Within their Delivery Plan, RCUK state that they will “co-ordinate and harmonise increased engagement in innovation and knowledge transfer by the Research Councils”.¹³³ RCUK also told us that “whilst having varied academic and user bases, the eight Research Councils work together where appropriate across a range of knowledge transfer activities, through the RCUK Knowledge Transfer Group (KTG)” an assembly which “provides a focal point for sharing information and good practice on knowledge transfer and a hub for collective dialogue with external organisations”.¹³⁴

57. Despite interaction of the Research Councils through the KTG, there has been much criticism with respect to how well the Councils co-ordinate their knowledge transfer activities, for example by the 1994 Group who told us “Knowledge transfer is an area of increasing interest and activity on the part of the Research Councils, but there is considerable variation between them in effort, approach and success”.¹³⁵ We also heard calls for a stronger role for RCUK in this area, for example, from the CBI who stated that “there is a very strong need for RCUK to identify and disseminate best practice across the Research Councils to ensure that they are operating with optimum efficiency and having the greatest possible impact, collectively and individually”.¹³⁶ We also heard that, currently, there appears to be little added value from RCUK. For example, AstraZeneca told us that “whilst the mission statement of RCUK is commendable, it is not clear to us what additional value RCUK has delivered to the effectiveness of the research, training and KT activities of the eight RCs [Research Councils]”¹³⁷ and QinetiQ commented that there is “an obvious need for co-ordination amongst the various funding bodies but [that] the role of the RCUK umbrella body is not particularly visible”.¹³⁸

58. The Research Councils were unwilling to accept that there is a need for increased effort toward sharing of best practice and general co-ordination of their knowledge transfer activities. Professor Diamond said that this “is precisely what the knowledge transfer group does” and that it is on an “upward trajectory”.¹³⁹ However, with the exception of forming the BBSRC Business Plan Competition into a cross-Council scheme, we have found little evidence for activity by the KTG and we were disappointed that the Research Councils seemed unable to provide us with examples of benefits gained through either the KTG or RCUK in respect of co-ordination for knowledge transfer.¹⁴⁰

133 RCUK, RCUK Delivery Plan, www.rcuk.ac.uk/documents/deliveryplan.pdf, p 19

134 Ev 62

135 Ev 128

136 Ev 135

137 Ev 104

138 Ev 138

139 Q 253

140 Qq 252-54

59. Whilst the RCUK view that different schemes are required to benefit individual Councils' respective communities may be valid,¹⁴¹ there are clearly overlapping areas and advantage could be gained from more effective sharing of best practice and co-ordination where appropriate. For example, perhaps a cross-Council approach toward the employment of external brokers to help identify and develop potential knowledge transfer opportunities could be taken. **We have found little evidence of Research Council co-ordination or sharing of best practice in the context of their knowledge transfer activities and we have not been persuaded that the Knowledge Transfer Group has achieved much in the two years since its formation. Also, despite their clear remit to co-ordinate and harmonise, we have not seen any added value from RCUK in this area. We urge the Research Councils and RCUK to take the necessary steps to enhance the effectiveness of their co-ordination in knowledge transfer.**

5 Research Council support for knowledge transfer

Introduction

60. In its recent consultation paper taking forward the Science and Innovation Investment Framework 2004 – 2014, the Government indicated that it “believes there is scope to review the effectiveness of the Research Councils’ existing structure and operations, to maximise opportunities for knowledge transfer and increase the impact of excellent research on the wider economy”.¹⁴² We therefore, sought to examine the effectiveness of current Research Council mechanisms in support of knowledge transfer.

Knowledge transfer schemes

61. The Research Councils support research and training across a wide range of academic disciplines and have developed an array of approaches to support knowledge transfer which, according to RCUK “reflect the breadth of science and research supported”.¹⁴³ We were told by RCUK, in reference to the specific challenges which must be addressed for successful knowledge transfer that “the interplay between creativity and technology in the creative industries requires different knowledge transfer models than those of traditional manufacturing industries” and that “there is strength in the diversity of this system, with each Council providing a strong focus for their research and user communities”.¹⁴⁴ Since they have taken this approach to focus on specific requirements of their respective communities, between them the Councils fund a significant number of knowledge transfer activities, which they group under four headings:

- Co-operation in education and training at masters and doctoral level
- People and knowledge flow
- Collaborative research with users
- Commercialisation including IP exploitation and entrepreneurial activities.¹⁴⁵

62. We agree with the Lambert Review that one of the most effective forms of knowledge transfer is through the flow of personnel between industry and academia. Lambert said that “the most exciting collaborations arise as a result of like-minded people getting together—sometimes by chance—to address a problem. Encouraging academics and business people to spend time together should be a high priority”.¹⁴⁶ We were, therefore, encouraged to hear strong support for Research Council activity in this area. QinetiQ told us that “The

¹⁴² HM Treasury, Department of Trade and Industry and Department for Education and Skills, Department of Health, *Science and innovation investment framework 2004–2014: next steps*, March 2006, chapter 3, p 23

¹⁴³ Ev 55

¹⁴⁴ As above

¹⁴⁵ As above

¹⁴⁶ Richard Lambert, *Lambert Review of Business-University Collaboration*, December 2003, chapter 1, para 1.24

RCs [Research Councils] are doing much more than previously to promote knowledge transfer between university researchers and industry”.¹⁴⁷ Research Council efforts to improve co-operation in education and training at masters and doctoral level also received praise, for example from AstraZeneca who told us of the significant benefits “in terms of quality of research project and training, experience of working in an industrial environment and promoting links between academia and industry” that current schemes bring. We also received positive comment on Research Council schemes directed at boosting commercialisation of research, for example from the Association of Research and Industrial Links (AURIL) who told us that schemes such as “the Research Councils’ Business Plan competition and the Follow-On Fund have been highly successful and of major benefit to UK universities”.¹⁴⁸ **We were impressed by the evidence we have received and welcome such clear Research Council successes in supporting knowledge transfer.**

63. Whilst the Research Councils have clearly made some positive moves toward supporting knowledge transfer, we are concerned about the potential for confusion surrounding the considerable array of knowledge transfer schemes that they offer. For example, we heard from CaSE who told us that “even within the Research Councils, small pots of money appear as a bewildering array of fragmented initiatives”, pointing out that the BBSRC website shows 14 different schemes relating to knowledge transfer and innovation.¹⁴⁹

64. The Research Councils, however, did not appear at all concerned about such perceptions from the research community. We are disappointed by the apparent reluctance of the Research Councils to accept criticism in this area. Professor O’Nions told us that although there are “quite a number of schemes [which] vary according to the area [...] the general picture makes good sense”.¹⁵⁰ Professor O’Nions did, however, subsequently agree that the Research Councils should look toward simplification of the funding structure once a better understanding of the impact of different schemes had been gained.¹⁵¹ We also heard from Professor Diamond that he does not consider that the Research Councils’ strategy for knowledge transfer is fragmented and confused but that by “having a wide variety of schemes what one is able to do is to identify areas which we know have been seen to work in the past and which are useful in moving forward”.¹⁵² Professor O’Reilly however, took a different approach telling us that in his view “an ideal Research Council has only one scheme [...] but it is infinitely flexible”.¹⁵³ Professor Mason supported this view telling us that “In PPARC we operate exactly such a thing, a single fund with infinite flexibility”.¹⁵⁴

65. We too have found it difficult to ascertain a clear understanding of the many schemes the Councils support. Presentation across the Councils, of the many different knowledge

147 Ev 135

148 Ev 138

149 Ev 121

150 Q 30

151 As above

152 Q 250

153 Q 252

154 As above

transfer schemes, varies greatly and we did not find it at all easy to navigate and clarify which programmes are most suitable for different requirements. **We commend PPARC for the approach that they have taken to develop a single, flexible scheme. We recommend that the other Research Councils, with support from RCUK, apply this simplification to their own knowledge transfer funding strategies. Communication of Research Council knowledge transfer funding strategies should be improved. We recommend that RCUK develops a single, simple web portal through which information on all Research Council knowledge transfer schemes can be easily accessed.**

Full economic cost

66. In September 2005, following consultation between the Government, funding bodies and Higher Education Institutions (HEIs), the Research Councils changed the way in which they fund research. This change was brought in to redress the imbalance of significant increases in the volume of research in UK HEIs set against smaller increases in contributions towards indirect costs and to ensure sustainability of the research base.

67. Previously, Research Councils paid Higher Education Institutes (HEIs) all the direct costs of a research project such as materials but they only paid a contribution towards the indirect costs such as the salary-related costs of researchers or the resources to build research capabilities. The remainder of the indirect costs of research were met by the block grant awarded to individual institutes by the Funding Councils (Quality-Related Research Funding). The total cost, indirect and direct, of research is known as the full economic cost (FEC). FEC is derived from the Transparent Approach to Costing (TRAC). Under FEC, all HEIs will need to ensure that over their activities as a whole, their full economic costs are being recovered.

68. From September 2005, in accordance with ‘The Ten-year Science and Innovation Investment Framework’, Research Councils have paid 80 per cent of the full economic cost and where equipment, survey or similar costs exceed £50,000 on a grant, then the amount above this figure has been paid in full. The Government is providing extra funds to back the change: £120 million a year from 2005–06, rising to £200 million a year from 2007–08, for Research Council projects, as well as increased block grants for HEIs from Funding Councils, including £90 million to support charity-funded research.

69. The implementation of FEC as a mechanism for increasing the sustainability of the research base is still in early stages. During this inquiry we have heard suggestions that FEC may inhibit the development of collaborative work between UK universities and business. The Association of British Pharmaceutical Industry (ABPI) told us: “[FEC] has forced up the costs to industry of collaborating with British universities, and is likely to lead to a reduction in such collaborations”, warning that “within a competitive and global market for research, industry will place contracts according to where it can get the greatest value for money”. Furthermore, the ABPI said that “the move to full economic costing in the science base may not be helpful to the UK if it is used rigidly to set the price for work by academia for industry”. According to ABPI, “the policy of charging Full Economic Cost has further increased the already high cost of collaborative research in the UK, while ignoring the value to academia of access to pharmaceutical R&D facilities and other ‘in kind’ contributions. Recent experiences indicate that post doctoral collaborations in the UK are becoming as expensive as those in the US, and significantly more expensive than in

several other European countries”.¹⁵⁵ This view is shared by the CBI who state “The comparative competitiveness of the UK science base as a partner for innovation activity, is further highlighted by the introduction of Full Economic Costing, the short-term impact of which is likely to be a reduction in the volume of R&D conducted in the UK”.¹⁵⁶

70. When asked about this issue, Professor O’Nions told the Committee that “the huge benefit of Full Economic Costs is that it is a methodology which enables universities to know actually what it costs them to run their business. In terms of how then universities price research with business, there is no mandate that they have to recover 100 per cent of the full economic costs, 80 per cent of them or 50 per cent of them. The important thing is that they know what their costs are so universities have to make the decision, but, if they know what their costs are, then they can price accordingly [...] if a business thinks that the only way it can do a deal is if it pays 100 per cent of full economic costs, that may not necessarily be the case, and a university may, for strategic reasons, charge more or less”.¹⁵⁷

71. We do not believe that industry opinions on the implications of FEC, necessarily reflect the true situation. We aim to examine the impact of FEC when there is more evidence available. In the meantime, we urge the Research Councils to take a proactive approach toward communicating the FEC principle to industrial stakeholders. We also suggest that a close watch on the impact of FEC should be maintained and that effects on collaborative research are monitored.

Capacity for knowledge transfer

Research Council Expertise

72. If the Research Councils are to be effective in supporting knowledge transfer, then it is essential that their staff are adequately skilled. The expertise of the Research Councils in knowledge transfer has, however, been questioned. QinetiQ commented that “the RCs [Research Councils] need to understand the cost and complexity of issues of knowledge transfer” and “they should bring in experienced practitioners from outside and train their staff [...] to embrace new knowledge transfer activities”.¹⁵⁸ We were also told by the CBI that “it is essential that Research Council staff understand both academic and industrial needs” and that “the perception from industry is that the balance of experience within the Councils tends to the academic sector”.¹⁵⁹ Concerns of lacking expertise within the Research Councils in knowledge transfer were shared by the External Challenge Panel who found a “reliance on key individuals or organisations to provide leadership or services” and that arrangements for skills transfer should be made to reduce the risk to the Research Councils knowledge transfer teams and long term abilities.¹⁶⁰ We accept the view of Professor Brook that “there is a shortage of skilled and experienced knowledge transfer

155 Ev 117

156 Ev 130

157 Q 52

158 Ev 135

159 Ev 133

160 External Challenge Panel, *Independent External Challenge Report to Research Councils UK, “Knowledge Transfer in the Eight Research Councils”, April 2006, para 4.5*

people in the country as a whole”.¹⁶¹ We also consider that, as primary funders of public sector research, it is essential that the Research Councils build a skill base sufficient to enable them to work effectively toward delivering added value from the research they support. **Since effective knowledge transfer may encompass many different stakeholders including academia, policy makers and industry, it is important that the Research Councils fully consider the expertise they need to build to operate successfully.**

73. A major element required for the creation of expert knowledge transfer teams is consideration of the experience that future and current employees bring to the organisation. We therefore noted with interest the strategic decision taken by EPSRC to accept the need for “a breadth of expertise within our staff”, acknowledgement of which led the Council to recruit primarily from a broad spectrum of sectors. Consequently, EPSRC now maintains a staff base which currently consists, primarily, of employees from the industrial sector (indeed, only two of EPSRCs 300 staff were actually recruited from the academic sector).¹⁶² An additional element required in building staff base expertise is in the training and experience a staff member receives whilst in post. We were therefore interested to note the active engagement by EPSRC in seconding staff to and from industry.¹⁶³ **We commend EPSRC for the strategic approach it has taken in developing a broad skills base. We encourage the other Councils to use recruitment and secondments to strengthen knowledge transfer expertise.**

In-house structure

74. The Councils employ very different structures to support their innovation and knowledge transfer activities. Whilst some Councils have developed small knowledge transfer teams (for example, BBSRC) others have either contracted out knowledge transfer activities to external brokers (for example, NERC and PPARC) or sought to embed knowledge transfer across the full remit of their activities (for example, EPSRC). In addition, some Research Councils such as the Medical Research Council (MRC), and more recently the BBSRC, have set up centres that manage the exploitation of technology generated by their institutes. MRC Technology (MRCT) exploits the Intellectual Property (IP) arising from MRC investment through the development and commercialisation of know-how from MRC-funded Units and Institutes. We have heard much positive support for the management of IP by this mechanism. For example, GSK have told us that “the MRC are professional with their MRCT group and their licensing activity”.¹⁶⁴ However, we also recognise that, as explained by Professor Sir John Chisholm, that “The MRC has a different place because [...] in the life sciences actually there is more value in the original invention” and that “MRC are better organised than the other Research Councils, possibly because they have a clearer job to do there”.¹⁶⁵ **We commend the steps taken by MRC to**

161 Q 112

162 External Challenge Panel, *Independent External Challenge Report to Research Councils UK, “Knowledge Transfer in the Eight Research Councils”,* April 2006, p 18

163 Q 246

164 Q 162

165 Q 187

actively exploit the research resulting from their investment and we urge RCUK and the other Councils to follow the example of MRCT where appropriate.

Performance management

Scheme evaluation

75. During the inquiry, we learnt from Professor O’Nions that the Councils are not currently reviewing the schemes they support, but that they “might be a bit closer to creating schemes”.¹⁶⁶ In fact, other than through the efforts of the External Challenge panel, we have seen little evidence of any effort from the Research Councils to determine how well their schemes are serving the research community or the impact they are having. We therefore decided to carry out our own brief evaluation of the costs and impact of a small selection of current Research Council knowledge transfer schemes and requested further information on the following:

- a) RCUK Business Plan Competition;
- b) CASE studentships; and
- c) NERC Connect A & B and Partnership Research Grants.

76. The information we were given included data on the full range of the Business Plan Competitions, some promotional case studies of entrants¹⁶⁷ and data on the home institution and department of entrants. Full information was also provided on expenditure for CASE studentship and NERC schemes along with some data on the partners involved in the schemes and the graduating destinations of students.¹⁶⁸ The NERC data also included, after additional requests, the Output and Performance Measures for Connect A & B (Partnership Research Grants have not been running long enough for such data to be available).

77. Unfortunately, we did not find the additional data supplied by the Councils to be particularly helpful in determining the *impact* of their knowledge transfer spending. We were somewhat surprised to find that the Councils have such scant data on impact readily available. Several of the Councils asserted that collection of this information lies outside their remit and that they rely on information supplied by other agencies. For example, graduating student destinations are collected by the Higher Education Statistics Authority¹⁶⁹ which does not make distinction between those graduating from collaborative studentships and from other studentships.

78. For both the Business Plan Competition and CASE Studentships, the only information given on impact was in the form of case studies. These suggested very positive outcomes for the schemes, but we are concerned that more comprehensive and systematic evaluation is not normal practice. Case studies should be used in conjunction with full surveys of

166 Q 31

167 Not published

168 As above

169 Ev 150

participants, not as a stand-alone method of evaluation. The paucity of recent information provided for the Business Plan Competition indicated that this scheme has not been effectively analysed, with many costs unknown and little investigation of the future successes or failures of entrants, qualifiers and finalists. We understand that a retrospective review of the Business Plan Competition is currently underway which will, in part, rectify this problem. It would seem sensible, however, to continually monitor income and expenditure on a more detailed basis, and to regularly gather feedback from participants both during and after the competition. The Output and Performance Measures supplied for the NERC schemes included numbers of patents, publications and information about the sale of products resulting from the scheme, inputs to policy-making and prizes awarded to academics. This information is much closer to what we would expect in terms of impact measurement.

79. We find it surprising that the Research Councils have not actively evaluated the impact of the schemes they support, particularly in the case of the Business Plan Competition which is now supported across them. **It is difficult to see how the Research Councils can effectively allocate funding to different knowledge transfer activities in the absence of comprehensive data on their impact. We recommend that the Research Councils proactively seek out information required to evaluate impact and that, once such data has been obtained, full impact analysis of all Research Council knowledge transfer schemes is conducted. In addition, we recommend that Research Council funding for knowledge transfer is neither increased or decreased until more is known about the impact of the schemes.**

External Challenge

80. The External Challenge Panel was commissioned by RCUK to provide the Research Councils and OST with an external assessment of each Council's portfolio of knowledge transfer activities and future plans in this area. Each Council submitted information on the knowledge transfer activities they support. This information was then presented to and questioned by the Panel.

81. This was the first attempt of a review of this kind and there were clearly problems, illustrated by significant delays with respect to publication of the report. The terms of reference were not followed and the Panel did not focus on specific Research Council knowledge transfer schemes, as indicated by RCUK who said that "the primary purpose of this exercise was to provide the Research Councils with constructive feedback on their knowledge transfer plans and goals. By focusing instead on the wider economic agenda and the role of HEIs in knowledge transfer, the resulting report conveys a less comprehensive assessment of Councils' activities than anticipated".¹⁷⁰ Members of the External Challenge Panel challenged this, reporting that "the RCs [Research Councils] had unrealistic expectations of what could be achieved from such a rapid review".¹⁷¹ When asked for greater clarity on this issue, we were told that "it is a combination of things: partly the coherence of the material, so that people can get their heads around it, but also partly the

170 Ev 166

171 External Challenge Panel, *Independent External Challenge Report to Research Councils UK, "Knowledge Transfer in the Eight Research Councils"*, April 2006, Annex 4.1

availability, if you like, of free resource within a limited timescale to get some real content in the report”.¹⁷² This was followed with the explanation that “people on the Panel all have employment elsewhere, so you have to fit this in; some businesses are not willing to give up the free time, so people have to do it at evenings and weekends; so it has taken from December until now to get a report with some real substance in”.¹⁷³ We were also told that “reviewing eight different bodies under one banner has highlighted the difficulties for the Panel in providing a single view about KT [knowledge transfer] without these becoming eight separate reviews”.¹⁷⁴

82. We have concerns regarding RCUK management of this review. According to Professor John Murphy, the Panel chair, they were “pressured to release drafts of the report to the Research Councils”¹⁷⁵ who then gave feedback. Although in main, feedback was in correction of inaccuracies, there were a “few elements which [noted the Panel Chair], tended to steer the findings of the report”.¹⁷⁶ The Panel had not been previously aware that RCUK had reserved the right to amend the report¹⁷⁷ or that they could expect “aggressive feedback” on report content.¹⁷⁸ The Research Council view on this is somewhat different. When asked about problems encountered on drafting of the External Challenge report, Professor Diamond told us of numerous factual inaccuracies about Research Council activity which were contained in the initial report. We were then assured that corrections made by the Councils were only of “factual inaccuracies of what we did, not on the recommendations”.¹⁷⁹ Professor Diamond still felt that this was “an independent report,¹⁸⁰ a view shared by the Panel chair who also indicated that they have provided some “fairly strong messages [in the report]”.¹⁸¹

83. We welcome the idea behind conducting an External Challenge of Research Council activity in support of knowledge transfer. We consider that the processes employed led to a report with questionable independence. RCUK did not fully consider the resources required for a full review of this area, giving the External Challenge Panel a near impossible task. We recommend that the Councils conduct a detailed review of the processes involved in this External Challenge. Such a review should take account of problems such as provision of appropriate resources and timescales, and should enable the development of best practice to inform future exercises of this nature.

172 Q 88

173 As above

174 External Challenge Panel, *Independent External Challenge Report to Research Councils UK, “Knowledge Transfer in the Eight Research Councils”,* April 2006, Annex A4.1

175 Q 90

176 Q 92

177 Q 100

178 Q 103

179 Q 196

180 Q 198

181 Q 104

Further encouraging exploitation

Business skills development

84. Many academics are unclear on ‘how to’ transfer their knowledge. Despite clear intention from the Research Councils to encourage researchers to appropriately transfer the knowledge that they produce, we have seen limited evidence for provision of training (on a broad scale) to give them the skills to do so. A recent study by the University of Nottingham has indicated that reasons for failure of university spin-outs include: not properly estimating, planning and managing financial needs; poor business management skills and resistance to recruiting such skills; and not placing enough value on marketing as a necessary competence.¹⁸² The study also showed that venture capitalists were less interested in university spin-outs because it was recognised that they would need to build a management team around the academics (because they lacked required business skill). We consider that possession of commercialisation skills is important and we were encouraged to hear, from the External Challenge Panel, that the Research Councils have made a start in providing training of this type as part of their effort to move to a more knowledge transfer aware culture.¹⁸³ **We welcome recognition by the Research Councils of the importance of enhancing business skills and we encourage them to further develop training activities in this area, making them available to as many researchers as possible.**

Intellectual Property

85. Universities usually hold and manage the Intellectual Property (IP) from Research Council funded research. However, the Councils play a part in encouraging commercialisation, for example, by funding an annual ‘Business Plan Competition’ to help UK based researchers develop their ideas for commercialising research outputs by providing training and mentoring in the development of business plans and entrepreneurial skills. In addition, BBSRC, EPSRC, NERC and PPARC invest in the ‘Follow on Fund’. This scheme provides funds to enable researchers to demonstrate the commercial potential of their ideas, supporting them with salary and training costs whilst they commercialise work originally supported by the Research Councils.

86. The Lambert Review suggested that the Research Councils, in consultation with universities, the CBI and other industry groups, should agree a protocol for the ownership of IP in research collaborations.¹⁸⁴ The Government has recently commissioned a review of the UK’s IP framework,¹⁸⁵ which we await. Some of the evidence we received suggested there was indeed scope for improvement in IP arrangements with overwhelming support for universities to relinquish their hold on the IP if a more appropriate option is available. For example, the Institute of Physics claimed that “Intellectual Property needs to be managed sensibly by recognising that it is best owned and managed by the exploiting party, while ensuring that collaborating parties receive appropriate rights and returns that reflect

182 Binks, M. et al. *Venture Capital Finance and University Spinouts*, Nottingham University Business School, Nottingham, UK, 2004

183 Q 146

184 Richard Lambert, *Lambert Review of Business-University Collaboration*, December 2003, p 122

185 Due Autumn 2006

their contributions”.¹⁸⁶ QinetiQ said that “the cost of transferring research outcomes into the market is very high. Intellectual property may be overvalued by universities, a ‘new’ piece of knowledge may not add significant value for industry: in some instances it may threaten existing business, in others a new market must be created”¹⁸⁷ and “the recent emphasis on the universities’ Intellectual Property has not always been helpful. In particular, it has tended to encourage overambitious valuations and too many immature companies. The award of capital to new ventures must be accompanied by rigorous commercial disciplines if it is not to be misallocated”.¹⁸⁸ We also heard from Dr Ian Ritchie, who took a slightly stronger view, telling us that “usually, universities will have a fairly unrealistic view of the value of a potential spin-out business. In most cases the research team will have identified a potential commercialisation area, but will not yet have a product” and that it is “quite usual that the final product owes little more than an ‘original concept’ to the research team”.¹⁸⁹

87. The External Challenge Panel believes that the Research Councils should take more of an interest in university-held IP, stating that “Some RCs are using brokering to actively mobilise the transfer of IP to the user base but we were concerned that there appears to be little or no monitoring of projects, i.e. the investment made by the RC, emerging IP or how that IP is used or transferred to the user base [...] in cases where significant levels of funding are made available (e.g. projects of £3M/yr and above) the Councils should have closer involvement in the project management, and exploitation strategy, in order to help and provide best practice for the commercialisation of that IP”.¹⁹⁰

88. RCUK refute the view that there is a role for more active engagement of the Research Councils in IP saying that “whilst the Councils do have a responsibility for helping to create the climate and culture in HEIs to enable [exploitation] this to happen, we believe that direct intervention is undesirable”.¹⁹¹ We agree with RCUK on this issue. Whilst it is natural for industry and academia to have different expectations, we do not consider that it is the role of the Research Councils, to oversee IP arrangements. In addition, as shown earlier, the Research Councils do not necessarily have the appropriate expertise to enable them to work effectively in this area. **We believe that the Research Councils should maintain a ‘hands off’ approach to management of Intellectual Property within universities.**

186 Ev 125

187 Ev 137

188 As above

189 Ev 141

190 External Challenge Panel, *Independent External Challenge Report to Research Councils UK, “Knowledge Transfer in the Eight Research Councils”*, April 2006, para 4.3

191 Ev 167

6 Conclusion

89. This inquiry represents our first approach to scrutinising the activities of the Research Councils on a thematic basis. Since the eight Research Councils are very different, both in terms of the research they support and the structures they have in place for doing so, this has been a challenging exercise. However, through taking this thematic approach, we have been able to examine, not only how knowledge transfer is supported across the Research Councils, but how their approaches are co-ordinated. During this inquiry, rather than scrutinising each of the schemes the individual Councils have in place to support knowledge transfer, we have considered the scope for harmonisation, simplification and sharing of best practice. We have drawn general lessons about weaknesses in communication between the Research Councils and with their communities. We have also considered the role of RCUK in knowledge transfer and suggested how it can contribute to further improvement. Overall, we found thematic scrutiny of the Research Councils a useful approach which has drawn out some strong conclusions and recommendations.

90. We are encouraged that this inquiry has stimulated re-assessment of Research Council knowledge transfer activity, for example as indicated by extensive up-date of the innovation and knowledge transfer scorecard and RCUK Delivery Plan¹⁹², published 26th May 2006. We welcome the suggestions made in these documents and note that they are closely aligned with many of the recommendations we have made. In their response to this Report, we encourage the Research Councils and RCUK to provide further detail on how their knowledge transfer activities will be enhanced. Furthermore, we look forward to revisiting this topic and to monitoring further progress of Research Council support for knowledge transfer in the future.

192 Updated RCUK Delivery Plan and Scorecard, www.rcuk.ac.uk/documents/refreshdeliveryplan.pdf

Conclusions and recommendations

Role of the Research Councils

1. The Research Councils have an important role to play in adding value to the research supported across the UK and we welcome the Research Councils' commitment to support knowledge transfer. (Paragraph 19)

Co-ordination of UK support for knowledge transfer

2. We are not convinced that measures put in place to facilitate national co-ordination of knowledge transfer are sufficient and we believe that there is a need for co-ordination between all UK funders of knowledge transfer to be enhanced. We recommend that the Government takes the necessary steps to ensure a co-ordinated knowledge transfer strategy. We recommend that the Research Councils lead the development of a strategy through which engagement between all organisations currently involved in support of knowledge transfer can be enhanced. We consider that there is a particular need for increased engagement between RDAs and the Research Councils. We call on the Research Councils to develop effective working relationships with all RDAs, strengthening links where necessary, disseminating good practice and supporting RDAs in building up their expertise. (Paragraph 25)

The Research Councils view of knowledge transfer

3. We welcome efforts to develop a clear, cross-Council understanding of what the term 'knowledge transfer' should mean to the research community. We urge the Councils to clearly communicate what is and isn't included within their view of knowledge transfer. (Paragraph 29)
4. Whilst we accept that the Research Councils may sit at the 'push' end of the research chain, we are concerned by the perception that they are not interested in the requirements of industry. We urge them to address this perception and to ensure that user requirements are fully considered when determining funding priorities. (Paragraph 32)
5. We welcome the effort made by the Research Councils to set out future knowledge transfer priorities within their Delivery Plans. We find that some of the Research Councils have taken a narrow approach and that consequently, their Delivery Plans do not reflect the wider view of knowledge transfer. (Paragraph 35)

Engagement with stakeholders

6. We are concerned by negative perceptions of Research Council communication and engagement with their stakeholders. We urge the Research Councils to take steps to engage business users more effectively. It is important that the Councils clearly consult and act upon the views of all stakeholders, addressing the perception that they are only interested in informing them. (Paragraph 38)

7. We believe that there is a need to enhance SME-Research Council engagement considerably. We recommend that the Research Councils are more proactive in their engagement with SMEs, recognising that very distinct challenges must be overcome if SMEs are to be successfully involved in knowledge transfer, for example in collaborative work with universities. (Paragraph 40)

Balancing priorities

8. The Research Councils knowledge transfer agenda, whilst important, should not detract from their main priority, the funding of basic research. The Research Councils should challenge the perception that research funding is at risk by clarifying and clearly communicating future financial allocations and plans for knowledge transfer. (Paragraph 45)
9. We remain convinced that the main role of the Research Councils is in the support of basic research. We accept that there is a blurred line between basic and applied research and we acknowledge Research Council use of the term 'frontier research' to describe the research they support. We still think there is value in use of the terms 'basic' and 'applied' research. The Research Councils need to take steps to ensure that they are recording sufficient information about the research they are supporting to enable them to rapidly respond to concerns about funding levels for basic and applied research. (Paragraph 47)

Embedding a knowledge transfer culture

10. We commend PPARC for its efforts to promote the importance of applicability and knowledge use to researchers. We urge PPARC to actively communicate its intentions where knowledge transfer is included within grant proposal evaluation criteria and to clearly convey the message that knowledge transfer will not determine the success of a grant application. We recommend that the other Research Councils consider this approach as a mechanism for embedding a more result-orientated culture. (Paragraph 53)

Performance measurement

11. We welcome the publication of Research Council performance assessment metrics but consider that refinement is required. We are particularly concerned that the Output 2 metrics, as they stand at present, measure activity rather than output and that they may influence the activities of the research community. We recommend that the Research Councils and RCUK regularly review the assessment metrics and the impact they are having, reporting back periodically. (Paragraph 55)

Cross-Council co-ordination

12. We have found little evidence of Research Council co-ordination or sharing of best practice in the context of their knowledge transfer activities and we have not been persuaded that the Knowledge Transfer Group has achieved much in the two years since its formation. Also, despite their clear remit to co-ordinate and harmonise, we

have not seen any added value from RCUK in this area. We urge the Research Councils and RCUK to take the necessary steps to enhance the effectiveness of their co-ordination in knowledge transfer. (Paragraph 59)

Knowledge transfer schemes

13. We were impressed by the evidence we have received and welcome such clear Research Council successes in supporting knowledge transfer. (Paragraph 62)
14. We commend PPARC for the approach that they have taken to develop a single, flexible scheme. We recommend that the other Research Councils, with support from RCUK, apply this simplification to their own knowledge transfer funding strategies. Communication of Research Council knowledge transfer funding strategies should be improved. We recommend that RCUK develops a single, simple web portal through which information on all Research Council knowledge transfer schemes can be easily accessed. (Paragraph 65)

Capacity for knowledge transfer

15. Since effective knowledge transfer may encompass many different stakeholders including academia, policy makers and industry, it is important that the Research Councils fully consider the expertise they need to build to operate successfully. (Paragraph 72)
16. We commend EPSRC for the strategic approach it has taken in developing a broad skills base. We encourage the other Councils to use recruitment and secondments to strengthen knowledge transfer expertise. (Paragraph 73)
17. We commend the steps taken by MRC to actively exploit the research resulting from their investment and we urge RCUK and the other Councils to follow the example of MRCT where appropriate. (Paragraph 74)

Performance management

18. It is difficult to see how the Research Councils can effectively allocate funding to different knowledge transfer activities in the absence of comprehensive data on their impact. We recommend that the Research Councils proactively seek out information required to evaluate impact and that, once such data has been obtained, full impact analysis of all Research Council knowledge transfer schemes is conducted. In addition, we recommend that Research Council funding for knowledge transfer is neither increased or decreased until more is known about the impact of the schemes. (Paragraph 79)

External challenge

19. We welcome the idea behind conducting an External Challenge of Research Council activity in support of knowledge transfer. We consider that the processes employed led to a report with questionable independence. RCUK did not fully consider the resources required for a full review of this area, giving the External Challenge Panel a

near impossible task. We recommend that the Councils conduct a detailed review of the processes involved in this External Challenge. Such a review should take account of problems such as provision of appropriate resources and timescales, and should enable the development of best practice to inform future exercises of this nature. (Paragraph 83)

Further encouraging exploitation

20. We welcome recognition by the Research Councils of the importance of enhancing business skills and we encourage them to further develop training activities in this area, making them available to as many researchers as possible. (Paragraph 84)
21. We believe that the Research Councils should maintain a 'hands off' approach to management of Intellectual Property within universities. (Paragraph 88)

Formal Minutes

Tuesday 6 June 2006

Members present:

Mr Phil Willis, in the Chair

Dr Brian Iddon
Bob Spink

Dr Desmond Turner

Draft Report (Research Council Support for Knowledge Transfer), 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 90 read and agreed to.

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

Ordered, That the Appendices to the Minutes of Evidence taken before the Committee be reported to the House.

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

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Wednesday 7 June at nine o'clock.]

Witnesses

Wednesday 15 March 2006

Page

Professor Sir Keith O’Nions, Director General of the Research Councils, Office of Science and Technology Ev 1

Professor Christopher Snowden, Vice-Chancellor, University of Surrey, **Professor Diana Green**, Vice-Chancellor, Sheffield Hallam University and **Dr Bob Bushaway**, Chairman, AURIL Council Ev 10

Wednesday 29 March 2006

Professor John Murphy, Chairman, **Mrs Barbara Doig**, Member, and **Professor Richard Brook OBE**, Member, External Challenge Panel Ev 16

Sir John Chisholm, Executive Chairman, QinetiQ Group plc, **Dr Malcolm Skingle**, Director, Academic Liaison, GlaxoSmithKline, **Tony McBride**, CBI (Confederation of British Industry) and **Dr Ian Ritchie**, Technology Entrepreneur, Coppertop Ev 25

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Professor John O’Reilly, Chief Executive, Engineering and Physical Sciences Research Council, **Professor Ian Diamond**, Chief Executive, Economic and Social Research Council and Chair of Research Councils UK Executive Group, **Professor Keith Mason**, Chief Executive, Particle Physics and Astronomy Research Council and **Professor Philip Esler**, Chief Executive, Arts and Humanities Research Council Ev 32

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