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Science and Technology Committee

The Legacy Report

Ninth Report of Session 2009–10

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 Government Office for Science. Under arrangements agreed by the House on 25 June 2009 the Science and Technology Committee was established on 1 October 2009 with the same membership and Chairman as the former Innovation, Universities, Science and Skills Committee and its proceedings were deemed to have been in respect of the Science and Technology Committee.

Current membership

Mr Phil Willis *(Liberal Democrat, Harrogate and Knaresborough)(Chair)*
Dr Roberta Blackman-Woods *(Labour, City of Durham)*
Mr Tim Boswell *(Conservative, Daventry)*
Mr Ian Cawsey *(Labour, Brigg & Goole)*
Mrs Nadine Dorries *(Conservative, Mid Bedfordshire)*
Dr Evan Harris *(Liberal Democrat, Oxford West & Abingdon)*
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Graham Stringer *(Labour, Manchester, Blackley)*
Dr Desmond Turner *(Labour, Brighton Kemptown)*
Mr Rob Wilson *(Conservative, Reading East)*

Powers

The Committee is one of the departmental Select Committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No.152. These are available on the Internet via www.parliament.uk

Publications

The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at http://www.parliament.uk/science
A list of reports from the Committee in this Parliament is included at the back of this volume.

Committee staff

The current staff of the Committee are: Glenn McKee (Clerk); Richard Ward (Second Clerk); Dr Christopher Tyler (Committee Specialist); Xameerah Malik (Committee Specialist); David Ferguson (POST Intern); Andy Boyd (Senior Committee Assistant); Camilla Brace (Committee Assistant); Dilys Tonge (Committee Assistant); Melanie Lee (Committee Assistant); Jim Hudson (Committee Support Assistant); and Becky Jones (Media Officer).

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Summary

Following a two year absence, this Science and Technology Committee was re-formed in October 2009 to conduct cross-departmental scrutiny of science and technology. This Report is the last from this Committee and summarises the work we have accomplished during this session. It also reviews the historical landscape of science scrutiny in Parliament across the work of our predecessor committees and documents the impacts they had on policy within Whitehall and the culture of scientific debate within Westminster.

The need for a science committee with a broad remit is not new and has been apparent to many parliamentarians over the last 70 years, a period in which science has come to exert a strong influence on many aspects of public life. The first organised science lobby was established in the 1930s as the Parliamentary Scientific Committee. However, the first select committee on science and technology was not formed until 1966. Active until it was disbanded in 1979, this committee produced several important reports and helped to establish many of the current day norms of select committee practice, such as visits outside of Westminster.

The next dedicated science committee was not established until 1992, and during this 13 year absence parliamentary scrutiny of scientific issues reduced. Since re-established in 1992 a science committee has existed in various guises and has produced many important reports. We highlight several inquiries and reports which had significant impact in informing legislative decisions and holding government to the standard of evidence based policy making.

The science committee has frequently been innovative in its working: conducting evidence sessions via video link; allowing the public to suggest inquiry topics; engaging with young people; and conducting parallel inquiries with a counterpart committee in the USA.

The various models for science scrutiny tested by parliament over the years clearly show that the most effective route to an appropriate level of science scrutiny is a free standing committee with a remit to consider science and technology issues wherever they fall across government.

1 Introduction

1. It is normal at the end of a session to produce a report outlining what work the Committee has undertaken over the previous 12 months, rather like an annual report. We have decided to take a slightly different approach because of the unique position in which we, as a committee, find ourselves.

2. The Science and Technology Committee has only recently been re-formed following a two-year period during which science scrutiny was within the purview of the Innovation, Universities, Science and Skills Committee. We have had only a short time—about six months—to re-instigate cross-departmental science scrutiny before the end of this Parliament. When the new Parliament assembles following the general election, a decision will have to be taken on whether there should be a free-standing Science and Technology Committee. We have previously argued that there should be,[1] and we shall do so again here.

3. Unlike the usual end-of-term report card, this Report examines the history and impact of science and technology scrutiny in the House of Commons. Chapter 2 gives a brief history of more than 40 years of science scrutiny. Chapter 3 covers the work of this Committee this session. Chapter 4 takes a case study approach to examine the impact of Science and Technology Committees. Finally, Chapter 5 outlines some of the Science and Technology Committee's recent innovations in parliamentary scrutiny.

4. This Report amounts to a statement on why a free-standing, cross-departmental Science and Technology Committee is an essential part of parliamentary scrutiny.

1 Science and Technology Committee, Thirteenth Report of Session 2006-07, *The Last Report*, HC 1108, para 16

2 Science and technology parliamentary scrutiny

Introduction

5. In the 1930s and 1940s a campaign emerged that argued for a greater involvement of science in parliamentary affairs. Headed by prominent figures such as the author H.G. Wells and Sir Richard Gregory, the then editor of *Nature*, this led in 1933 to the formation of the Parliamentary Science Committee, an association of Members and extra-parliamentary interest groups, which set out to promote and debate science and its relationship with policy.[2] At the outbreak of war in 1939 this group evolved into the Parliamentary and Scientific Committee—a group still in existence today[3]—which in the post-war period began to gain influence as its membership and profile grew.[4] However, the informal nature of this committee—it had no statutory powers—constrained its ability to conduct authoritative inquiries on government policy and legislation, an increasing volume of which concerned science and technology related issues.[5]

6. The absence of any formal or generalised procedures for Parliament to exercise oversight within a specific policy area was not unique to science. In 1964–65, amid an increasing concern that Parliament's role was in decline,[6] the Committee on Procedure recommended that greater leeway be given to Parliamentary committees—at that time sub-committees of the Estimates Committee—to "specialise" in areas of policy.[7] This measure was intended to meet growing calls by Members to establish a system whereby the House could question government on a wider range of specific topics or policy areas. This was later endorsed by the Government when, on the opening of Parliament in April 1966, the Prime Minister, Rt Hon Mr Harold Wilson MP, said: "I believe the time has now come when we might consider an experiment to extend [the committee] system over a wider field of public administration".[8] This "experiment" involved the establishment of two specialist committees. As the preceding decade had seen public spending on civil research and development quadruple,[9] science and technology was an obvious candidate for one of these[10] and in 1966 the first Science and Technology Select Committee was formed[11] (the other new committee was on agriculture).

2 Stuart Walkland, "Science and parliament: The origins and influence of the Parliamentary and Scientific Committee", *Parliamentary Affairs*, vol 16(1963), pp 308–320

3 The Parliamentary and Scientific Committee website, www.vmine.net/scienceinparliament/

4 Stuart Walkland, "Science and parliament: The origins and influence of the Parliamentary and Scientific Committee", *Parliamentary Affairs*, vol 16(1963), pp 308–320

5 Norman Vig and Stuart Walkland, "Science Policy, Science Administration and parliamentary reform" *Parliamentary Affairs*, vol 16 (1966), pp 281–294

6 For further reading see: Anthony Barker, "Parliamentary Studies, 1961–1965: A bibliography and comment" *Political Quarterly*, July-Sept (1965) pp 347–359

7 Select Committee on Procedure, Fourth Report of Session 1964–65, HC 303

8 HC Deb, 21 April 1966, col 76

9 Norman Vig and Stuart Walkland, "Science Policy, Science Administration and parliamentary reform" *Parliamentary Affairs*, vol 16 (1966), pp 281–294

10 HC Deb, 3 November 1965, col 1148

7. The Government's acceptance in 1966 of the principle that there should be dedicated "specialist" committees signified the beginning of a formal system of scientific oversight by Parliament, one that remains in existence today as the Science and Technology Select Committee. However, although our Committee bears much resemblance to its 1960s counterpart, the Committee has not been a continuous entity since that time and has existed in various incarnations, dictated by the changing structure of the committee system.

1966–1979

8. The first specialist Select Committee on Science and Technology was established by the House in December 1966 and its members (listed in Box 1) appointed in January 1967. The broad remit given to the Committee was to "consider science and technology and report thereon".[12] Re-appointed following general elections in 1970 and 1974,[13] the Committee remained in existence until 1979 when it was abolished during the comprehensive reorganisation of the select committee system. During this time two Members served as Committee Chairman, Mr Arthur Palmer (1966–1970 and 1973–1979) and Mr Airey Neave (1970–1973) (see Box 2 for a full list of Chairmen). In fulfilling its far-reaching remit the 1966–1979 Committee published a wide variety of reports, making recommendations concerning highly technical issues as well as general policy and funding. It was in the vanguard with other committees in making notable advances in instituting several of the present-day norms of committee procedures:

> The [Science and Technology] Committee [...] succeeded in establishing the principle of a select committee meeting regularly in public, of ministers and officials giving testimony to a committee when called, and, after a considerable confrontation between the Executive and Parliament, the freedom of a committee to travel and hear evidence from whomever it wishes.[14]

9. The right of the Committee to make visits beyond Westminster, something that a contemporary Committee may in some cases be criticised for *not* doing, was met in the 1960s with strong resistance from the Government. The Chairman, however, was convinced of the value of such trips, and made "the strongest representation" to the Government that it should be given this right.[15] Commenting on the success of its visits in its first report the Committee noted: "In retrospect, therefore, the apparent fears and apprehensions aroused in London by the intended visits [...] seem even more meaningless then they did when [the] Committee were endeavouring to make the arrangements."[16]

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11 HC Deb, 14 December 1966, col 477

12 HC Deb, 14 December 1966, col 477

13 In 1974, there were two general elections; the Committee was re-established after the second election.

14 Michael Jogerst, *Reform in the House of Commons: The Select Committee System*, University Press of Kentucky, 1993, p 77

15 Science and Technology Committee, First Report from Session 1966–67, *United Kingdom Nuclear Reactor Programme*, HC 381, para 5

16 HC (1966–67) 381, para 8

Box 1: Membership of first Science and Technology Committee, appointed in January 1967

Mr Norman Atkinson	Mr Eric Lubbock
Mr Tam Dalyell	Mr Airey Neave
Dr Ernest Davies	Sir Ian Orr-Ewing
Mr David Ginsburg	Dr David Owen
Mr Stephen Hastings	Mr Arthur Palmer (Chair)
Mr Robert Howarth	Mr Brian Parkyn
Sir Harry Legge-Bourke	Mr David Price

10. For its first inquiry the Committee decided to hold one detailed investigation into an issue of "prime national importance" and in 1967 published a report on the *United Kingdom Nuclear Reactor Programme*, a technical subject involving considerable public funds.[17] In gathering views and evidence for this inquiry members of the Committee made visits to nuclear facilities in Europe and the USA and held 13 public evidence sessions. When debating the subject in the House the Minister of Technology, Rt Hon Tony Benn MP, referred to this Report as "a document of great value", which contained a "wealth of knowledge and informed criticism" that "marshals the facts, and makes clear recommendations".[18]

11. In the next Parliamentary session the Government asked for the Committee's assistance in investigating the UK's first major oil spill from the shipwrecked Torrey Canyon tanker in 1967. The Committee accepted the Government's request and formed a Sub-Committee to investigate the matter, producing the 1968 Report *Coastal Pollution*.[19] This Report was a comprehensive overview of the issues surrounding marine pollution and ranged from risk reduction via marine traffic systems to the effects of clean up operations on marine life.

12. Over the thirteen years of the original Committee's existence, 1966–1979, it produced 34 reports. Many of these early reports showed remarkable foresight in identifying forthcoming issues of national importance and made significant recommendations, for example:

- recognising that computer technology would become increasingly important and recommending that strategic investments should be made in this area (1971);[20]
- that "a Minister of State should be appointed […] with special responsibility for science and technology" (1975);[21] and
- "the development of alternative energy sources in the UK should be pursued with vigour and determination" (1977).[22]

17 HC (1966–67) 381

18 HC Deb, 23 May 1968, col 969

19 Science and Technology Committee, First Report of Session 1967-68, *Coastal Pollution,* HC 421

20 Science and Technology Committee, Fourth Report of Session 1970-71, *The Prospects for The United Kingdom Computer Industry in the 1970's*, HC 621

21 Science and Technology Committee, Third Report of Session 1975-76, *University –Industry Relations,* HC 680, para 3.86

13. With its broad remit to report on science and technology the Committee took evidence from across Whitehall and was able to track down responsibilities when the buck was passed from department to department. When a minister attempted to fob it off, the Committee could summon all departments with an interest and pin down where responsibility lay. This is, in our view, a decided advantage of having a dedicated, freestanding—that is, cross-departmental—science and technology committee.

1979–1992

14. In 1979 the select committee system was substantially reorganised, establishing new committees that directly scrutinised the "expenditure, administration and policy" of individual government departments,[23] and as such largely removing freestanding and "specialist" subject ones. Since no Department of Science and Technology, nor a Minister for Science, existed in 1979 a Science and Technology Committee was not re-established. Scrutiny of the Government by the House on scientific matters became the responsibility of the Education, Science and Arts Committee. At the time Members, such as Mr David Price MP, a former Conservative opposition spokesman on education and science, argued that this re-organisation had unnecessarily severe consequences on Parliament's capacity to investigate scientific matters, stating:

> I wish to draw the attention of the House particularly to the Select Committee on Science and Technology. That Committee has an experience and a competence that it would be a pity to break up. That sort of competence does not arise quickly. [...] only when one has acquired a degree of special knowledge in a Select Committee can one be really effective. That is particularly true when dealing with scientific matters that cut not only across Departments but across the boundary between the public and private sector and across the boundaries between countries.[24]

15. Despite these protests, a freestanding science and technology committee was not retained. This had some notable effects on the parliamentary scrutiny of science-related policies and legislation. First, as the remit of the new Committee directed it towards four separate policy areas—education, the arts, library services and science—the time and resources available for inquiries concerning scientific or technological subjects greatly diminished. The Committee's focus was largely set on education, and of the 40 reports published between 1979 and 1992, 18 of these directly concerned education policies, whilst only three specifically addressed a science or technology issue.[25] As shown in Table 1 this was a dramatic decline from the pattern of the previous decade set by the old Committee, though it must be added that the work of some of the new departmental select committees included scientific aspects, which is not recorded in the Table. Second, the principal aim of

22 Science and Technology Committee, Third Report of Session 1976–77, *The Development of Alternative Sources of Energy for the United Kingdom,* HC 534

23 HC Standing Order 152

24 HC Deb, 25 June 1979, col 95

25 Education, Science and Arts Committee, First Special Report of Session 1981–82, *Biotechnology: Interim Report on the Protection of the Research base in Biotechnology,* HC 289-I; Education, Science and Arts Committee, First Report of Session 1984–85, *The Future of the Science Budget*, HC 46; Education, Science and Arts Committee, First Report of Session 1990–91, *Science Policy and the European Dimension*, HC 127; the Committee also published minutes of evidence taken on science policy on 25 March 1981: HC (1980–81) 245-i, but did not produce a report. The science budget was also briefly mentioned in the Committee's annual departmental scrutiny reports from 1987 to 1991.

the new select committee structure was departmental scrutiny, in this case the Department for Education and Science. The activities of the Government Chief Scientific Adviser, who was at that time located within the Cabinet Office, were therefore largely beyond the new Committee's reach.

16. In response to these changes, the House of Lords moved, in 1980, to establish its own select committee with a remit "to consider science and technology",[26] identical to that of the abolished House of Commons committee.[27]

17. Despite the appointment of the House of Lords Science and Technology Committee and the activities of other new departmental House of Commons committees, such as the Environment and the Energy Committees, the new select committee structure left gaps in areas previously scrutinised by the old Committee (see Table 1).

1992–2007: the modern Science and Technology Committee

18. In 1992 the merger of the Office of the Chief Scientific Adviser with the scientific portfolio of the Department of Education and Science created the Office for Science and Technology (OST), headed by the Chief Scientific Adviser. Accompanying the creation of the OST, the House of Commons re-appointed a select committee on Science and Technology, chaired by Sir Giles Shaw (see Box 2), to scrutinise it. Initially housed within the Cabinet Office, the OST was moved in 1995 to the Department of Trade and Industry (DTI) and in 2006 it was renamed the Office of Science and Innovation (OSI).

19. Although with a somewhat narrower remit than that of the 1966–79 Committee—the new committee would "examine the expenditure, administration and policy" of the OST rather than having a cross-departmental focus on science and technology—this re-appointment allowed for the first time since 1979 the direct scrutiny of the work of the Chief Scientific Adviser. An important effect of this was that Government funding of science through the Research Councils, involving over £1 billion of public funds, again became a regular topic of parliamentary scrutiny (see Table 1). During its existence, it produced several influential reports including those on cancer, carbon capture and storage, light pollution and stem cells, which are discussed in detail in chapter 4.

2007–2009: Innovation, Universities, Science and Skills Committee

20. In 2007 the science portfolio moved to the newly created Department for Innovation, Universities and Skills (DIUS). The OSI was split into the Government Office for Science (GO-Science), created to assist the Chief Scientific Adviser, and the Science and Innovation Group, which was responsible for the science budget.

21. Since the OSI no longer existed and a new committee was required to scrutinise DIUS, it was proposed that the Science and Technology Committee be dissolved. The predicted loss of a committee with a dedicated focus on science policy provoked a strong reaction from the UK's scientific community. In a letter to *The Guardian* 38 prominent scientists,

26 HL Deb, 23 January 1980, col 441

27 HL Deb, 11 December 1979, col 969

including the President of the Royal Society, the Director of the Wellcome Trust, and four Nobel laureates protested against the Committee's abolition:

> This committee does a great deal of vital work scrutinising scientific matters and the use of evidence across government departments and agencies. [...] Just as peer review is important in science, so is adequate oversight of the use of science in policy-making. The government has acquired a good reputation in the science world for supporting science. It could enhance its reputation further by ensuring the continuation of this, either through a stand-alone science and technology committee or through an adequately resourced and autonomous subcommittee of the DIUS select committee.[28]

22. However, despite these protests the Science and Technology Committee was abolished and a new Committee on Innovation, Universities and Skills (IUS) created to scrutinise the new department.

23. Many of the members of the Science and Technology Committee stayed on to become members of the new IUS Committee, including Mr Phil Willis, who retained the position of Committee Chair. Recognising that the oversight of science and technology would consume a significant portion of the new committee's time and resources the House set the membership at 14, rather than the select committee norm of 11, in order to allow sub-committees to be established when necessary.[29] Following further recommendations made in the previous Science and Technology Committee's final report,[30] the IUS Committee was also renamed to become the Innovation, Universities, Science and Skills (IUSS) Committee. This was intended to reflect more properly the importance of science within its brief.

24. Although only active for two sessions the IUSS Committee produced 18 reports covering a wide range of topics. As scrutiny of scientific issues formed only a part of the new Committee's extensive remit many of these covered areas relevant to the non-science portion of their brief. These included reports on the work of copyright tribunal,[31] the UK's skills base,[32] and the management of capital investments for further education colleges.[33] However, as much of the membership, and therefore scientific expertise, of the previous Committee had been retained the most influential reports produced by the IUSS Committee are arguably those on scientific issues. Amongst the most significant of these were, *Engineering: turning ideas into reality*,[34] a wide ranging report which looked into the condition of several UK based engineering industries, and *Putting Science and Engineering*

28 Letters to the Editor, *The Guardian*, 20 July 2007, p 41

29 HC Deb, 25 July 2007, col 939

30 HC (2006–07) 1108, para 7

31 Innovation, Universities and Skills Committee, Second Report of Session 2007–08, *The work and operation of the Copyright Tribunal,* HC 245

32 Innovation, Universities, Science and Skills Committee, First Report of Session 2008–09, *Re-skilling for recovery: After Leitch, implementing skills and training policies,* HC 48-I

33 Innovation, Universities, Science and Skills Committee, Seventh Report of Session 2008–09, *Spend, spend, spend? – the mismanagement of the Learning and Skills Council's capital programme in further education colleges,* HC 530

34 Innovation, Universities, Science and Skills Committee, Fourth Report of Session 2008–09, *Engineering: turning ideas into reality*, HC 50-I

at the Heart of Government Policy,[35] a constructive and comprehensive report that focussed on how science and engineering could be best incorporated into the framework of Government to provide the greatest benefit to good policy and governance.

25. The new Department for Innovation, Universities and Skills, created in 2007, was ultimately a short lived affair and the Committee was again altered during further departmental changes in 2009.

2009–2010: the re-establishment of the Science and Technology Committee

26. In a reorganisation of Whitehall in 2009, DIUS was merged with the Department of Business, Enterprise and Regulatory Reform (BERR) to create a large new department, the Department of Business, Innovation and Skills (BIS). As any Committee scrutinising this new department would have to cover universities, skills, business and regulatory reform as well as science and technology, the merger of these two departments, each with an associated committee, created an opportunity to re-establish a dedicated Science and Technology Committee with the membership of the IUSS Committee. There was wide support within the House for this, and as one Member, Mr Alan Duncan, the Conservative shadow Leader of the House put it "the biggest loser [of the 2009 reshuffle] was science".[36] Another, Mr David Heath, the Liberal Democrat shadow Leader of the House, stated:

> The Science and Technology Committee, before it was renamed, was an ornament to the House. It was a very valuable body. […] It was a wonderful Committee, precisely because it did not have to spend all its time looking at the activities of a particular Department and because it could range so widely over the scientific and technological aspects of the way in which the Government operate and pick out the areas in which it had particular expertise, or draw on such expertise, in order to inform the House and the Government. That is why the terms of reference are so important.[37]

27. Persuaded by these arguments, our present committee, which retained the membership of the IUSS Committee, was approved by the House on 25 June 2009.[6] Although our terms of reference ostensibly left us with a remit to scrutinise the work of GO-Science, the Deputy Leader of the House, Barbara Keeley, agreed that we should take "a wide-ranging approach […] examining the full scope of science policy and related matters across the Government".[38] This is something we have endeavoured to achieve in our activities during this session.

35 Innovation, Universities, Science and Skills Committee, Eighth Report of Session 2008–09, *Putting Science and Engineering at the Heart of Government Policy*, HC 168-I

36 HC Deb, 25 June 2009, col 992

37 HC Deb, 25 June 2009, col 995

38 HC Deb, 25 June 2009, col 987

28. In re-appointing a dedicated Science and Technology Committee in 2009 the House echoed the conclusions reached by its predecessors 43 years earlier when similar arguments were employed to establish the original committee.[39]

Box 2. Chairmen of the Science and Technology Committee: 1966 to 2010

Chair	Dates
Mr Arthur Palmer (Labour)	1966–1970
Mr Airey Neave (Conservative)	1970–1973
Mr Arthur Palmer (Labour)	1973–1979
No dedicated science committee between 1979–1992	
Sir Giles Shaw (Conservative)	1992–1997
Dr Michael Clark (Conservative)	1997–2001
Dr Ian Gibson (Labour)	2001–2005
Mr Phil Willis (Liberal Democrat)	2005–2010*

*From November 2007 the Committee was the Innovation, Universities and Skills Committee and then from March 2008 to September 2009 the Innovation, Universities, Science and Skills Committee; and from March 2010 *Chair* of the Committee

Conclusion

29. The IUSS Committee considered the future of science, engineering and technology scrutiny in the House of Commons in its Report on *Putting Science and Engineering at the Heart of Government Policy*,[40] and reached three conclusions. First, it highlighted the importance of engineering advice and suggested that "engineering advice differs from science advice, that engineering advice is lacking many policy areas across Government and that cross-departmental co-ordination of engineering programmes is weak".[41] It therefore concluded that engineering scrutiny should be part of the remit of a science and technology committee.[42] Second, that a committee membership of 14 with a quorum of four, rather than the usual 11 with a quorum of three, was problematic.[43] And third, that the cross-departmental nature of science, engineering and technology meant that the remit of the committee responsible for scrutinising those areas should be cross-departmental too.[44]

30. In this chapter, we have shown that over the last forty years, three approaches have been taken to scrutinising the Government's use of science and technology: (1) a departmental select committee with science and technology as part of its departmental remit; (2) a dedicated science and technology committee under the guise of a departmental select committee, with a brief to monitor the office of the Government Chief Scientific

39 HC Deb, 25 April 1966, col 427

40 HC (2008–09) 168-I

41 HC (2008–09) 168-I, para 209

42 HC (2008–09) 168-I, para 207

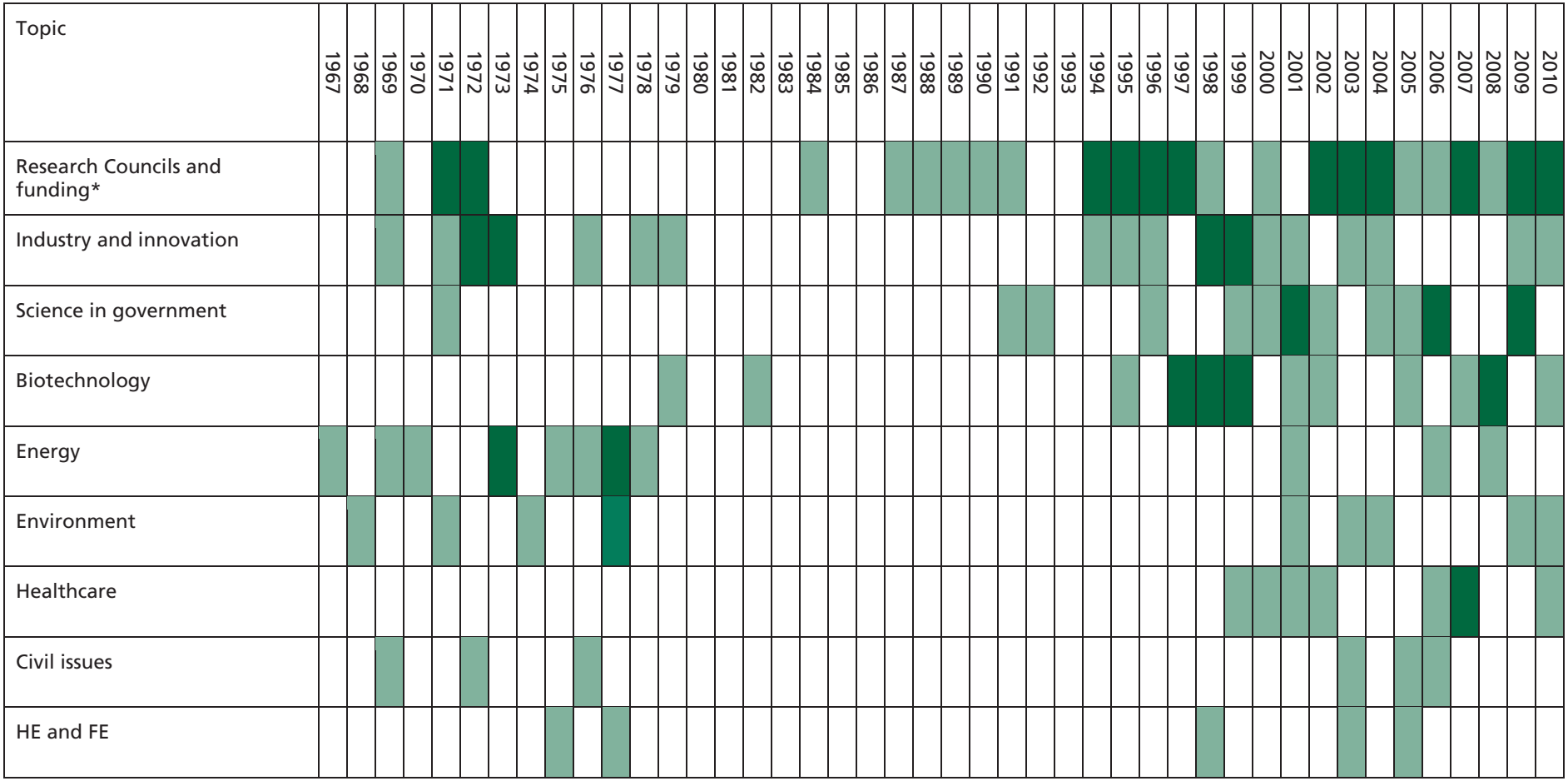
43 HC (2008–09) 168-I, para 212

44 HC (2008–09) 168-I, para 214

Adviser, which is the current model; and (3) a dedicated cross-departmental science and technology committee. In our view, the first model does not allow sufficient time and scope to do science and technology scrutiny justice, and the second model is vulnerable to the all too frequent machinery of government changes. The pressure for employing the third model—the dedicated committee that was originally adopted in 1966—has never gone away and in 2010, the House will have an opportunity to create such a Committee.

31. **We recommend that in the new Parliament there should be a committee responsible for scrutinising science, engineering and technology across government. We make three suggestions on how this committee should be formed: (1) it should have the prime responsibility for scrutiny of the Government's science unit and science minister, whatever the unit is called and wherever it lies; (2) it should be a freestanding committee with a cross-departmental remit; and (3) it should have a membership of 11 and a quorum of three.**

Table 1 Some common topics of S&T inquiries since 1966. Light shading indicates one inquiry that year on the topic. Dark shading indicates two or more. The list is not exhaustive. These only reflect inquiries by the Committee with a science remit and not by other committees which may at times investigate science related issues.



* Between 1987 and1991 a brief outline of the science budget was included in an annual expenditure review by the Education, Science and Arts Committee.

3 Work this session

32. Since we re-convened as the Science and Technology Committee in October 2009 in preparation for the final session of this Parliament, the Committee has conducted eight inquiries. We have continued to take the approach of our predecessor Committees by being both responsive to current events relevant to our remit and also, we hope, forward thinking in identifying areas of policy that would benefit from scrutiny. A strong theme in our work this session has been to pursue the view, encouraged by the Cabinet Office, that policy development—and implementation—should be evidenced based.[45]

Inquiries on long term issues

33. We have published two reports this session on areas of emerging technology that have implications for current and future policies: bioengineering and geoengineering. We have also continued the *Evidence Check* series, started by our predecessor IUSS committee to examine the degree to which an "evidence based" approach to policy and decision making has been adopted across government.

Evidence checks

34. Evidence based policy has been a continuous thread throughout all our work and is embodied in our thematic "Evidence Check" series of inquiries. Launched in July 2009, these were conceived with the explicit aim of testing the rigour and pervasiveness of the evidence based approach across government and sought to ask two specific questions on each area: (1) what is the policy? and (2) on what evidence is the policy based? We discuss the rationale for the *Evidence Check* programme in Chapter 5.

35. Prior to launching our first inquiry, we wrote to the Government with a list of ten subjects, asking that in each case it detail its policy and the evidential basis. The subject areas we requested policy details on included: swine flu vaccinations, licensing of homeopathic products, "wind turbine syndrome", CCTV, literacy interventions, the teaching of "pseudoscience" in universities, dyslexia and Brain Gym (a programme taught in some primary schools).[46] Having considered the Government's responses we chose to carry three of these forward into two full inquiries: *Evidence Check 1: Early Literacy Interventions*—which incorporated two of the topics, literacy and dyslexia—and *Evidence Check 2: Homeopathy*—concerning the licensing of homeopathic products and NHS funding.

45 Cabinet Office, *Modernising Government*, Cm 4310, March 1999

46 "Evidence Check" Innovation, Universities, Science and Skills Committee press notice No. 56, Session 2008–09, 3 August 2009; Science and Technology Committee, Fourth Report of Session 2009–10, *Evidence Check 2: Homeopathy*, HC 45, Ev 209-16

Evidence Check 1: Early Literacy Interventions

36. Our first evidence check inquiry focussed on early interventions into literacy problems.[47] This was divided into two parts: (1) literacy interventions and (2) the diagnosis and management of dyslexia. We received 36 written submissions and held oral evidence sessions on 4 and 9 November 2009, taking evidence from three panels, two on literacy and dyslexia and one composed of members of the Government.

37. In broad conclusion, we found that there was willingness from the Department for Children, Schools and Families to base its approach to early literacy interventions on the evidence. However, we discovered worryingly low expectations regarding the quality of evidence required to demonstrate the relative effectiveness and, in particular, the cost effectiveness of different programmes. The Government's policy that literacy intervention should take place early on in formal education and that this is cost effective, we found to be in line with the evidence. However, we found that the decision on which particular intervention to make was not based on the best quality sound evidence of either effectiveness or efficiency. We were particularly disturbed that the Government was setting its research priorities on the basis of the priorities of lobby groups.[48] We also set out the importance of Randomised Controlled Trials (RCTs) in the development of social policy.

38. The Government, while accepting the broad thrust of our Report, did not tackle head on many of our criticisms:

- We concluded that it was wrong to roll out Reading Recovery without making cost-benefit comparisons with other interventions.[49] The Government did not address this point.[50]

- We were concerned by the low quality of data, specifically the preference for reading/spelling ages rather than standardised scores.[51] The Government responded that it is "committed to collecting robust data", which was not our point.[52]

- We suggested that the Government's accepted definition of "dyslexia" was so broad and blurred at the edges that was difficult to see how it could be useful in any diagnostic sense.[53] This is particularly worrying as over emphasis on this vague definition could disadvantage other children with profound reading difficulties. The Government glossed over this point and simply maintained that a working definition was useful to enable the identification and management of dyslexia.[54]

47 Science and Technology Committee, First Report of Session 2009–10, *Evidence Check 1: Early Literacy Interventions*, HC 44

48 HC (2009–10) 44, paras 85–87

49 HC (2009–10) 44, para 37

50 Science and Technology Committee, Second Special Report of Session 2009–10, *Evidence Check 1: Early Literacy Interventions: Government response to the Committee's Second Report of Session 2009*–10, HC 385, para 3

51 HC (2009–10) 44, paras 39–40

52 HC (2009–10) 385, para 4

53 HC (2009–10) 44, para 71

54 HC (2009–10) 385, para 10

39. **We were disappointed that the Government failed to engage with our Report on early literacy interventions in a constructive manner. Either our concerns were right and the Government should have explained how it will take steps to improve its processes, or our concerns were misplaced and the Government should explain why. Avoiding important issues is unacceptable.**

Evidence Check 2: Homeopathy

40. For our second evidence check we chose to investigate the Government's policy on the licensing and funding of homeopathic products and treatments. The motivation for this inquiry was the Department of Health's response to our request for details on the licensing of homeopathic products, in which it stated that the "consideration of scientific evidence" had no role in the formulation of its licensing regime.[55] This inquiry generated a large amount of interest and we received around sixty written submissions, and a considerable number of background papers. As we had preceded the inquiry with a written evidence request to the Government, we were able to make its responses available to interested parties for comment when we issued our call for evidence. We held oral evidence sessions on 25 and 30 November 2009, during which we heard from three panels consisting of witnesses with a wide range of relevant expertise in the manufacture and use of homeopathic products and in the research and practice of homeopathy. We also took evidence from Mr Mike O'Brien QC MP, Minister for Health Services at the Department of Health (DH), Professor David Harper, Chief Scientist at the DoH, and Professor Kent Woods, Chief Executive of the Medicines and Healthcare products Regulatory Agency.

41. This inquiry exposed a serious discrepancy between the evidence base for homeopathy and the Government's policy to allow its provision through the NHS. When asked directly if he considered that there was any "any credible evidence"[56] to show that homeopathy worked beyond placebo effect the Minister replied "the straight answer is no".[57] However, despite this admission, the Government was reluctant to address the ethics and practicalities of prescribing pure placebos and the implications for informed patient choice. We were concerned that, while permitting the spending of public money on a treatment it considered to be purely a placebo, the Government had no clear view on the matter. A key recommendation we made in our Report was that this be addressed by recognising that the NHS should stop routinely prescribing placebos.[58] Our inquiry also exposed weaknesses in the labelling and licensing system used for homeopathic products, finding that evidence-based approaches to licensing had been rejected and that the user-testing of labels, provided as justification for allowing products to make medical claims, was poorly designed and misleading. We recommended that as homeopathic products were not medicines, they should not be licensed as such. Overall, the Committee found a worrying inconsistency in the Government's declared stance on evidenced based policy making and its policy regarding homeopathy.[59] We also took the opportunity to set out in more detail

55 HC (2009–10) 45, Ev 60, Q 2

56 HC (2009–10) 45, Ev 64, Q 174

57 HC (2009–10) 45, Q 175

58 HC (2009–10) 45, para 111

59 HC (2009–10) 45, para 154

what represents good evidence on matters of medical research and how best that evidence should be assessed.

42. The inquiry raised considerable controversy amongst both supporters and critics of homeopathy. The oral evidence sessions were much discussed online (on blogs and Twitter, for example) and the testimony of the witness representing Boots led to a mass protest against homeopathy in January 2010.[60] The fierce debate was amplified by the publication of our Report, which was covered by most of the national newspapers, radio and television, and also worldwide in countries such as Brazil, India and Australia. We received letters from the public and politicians, many criticising the Report and others praising our efforts. We expect the debate to continue and are pleased that our inquiry has made the Government and the public more aware of the importance of evidence based policies in healthcare provision and has stimulated debate on this subject.

Bioengineering

43. On 4 November 2009 we announced our intention to hold an inquiry on bioengineering.[61] We chose this as an important area for scrutiny because, first, we were aware that the Government considered bioengineering to be amongst the strategically important technologies for the 21st century. Second, we examined bioengineering to see if the UK was learning from past mistakes and ensuring that investment in research and development was not lost in translation. In a previous report we had investigated plastic electronics engineering,[62] a technology where the UK had a competitive advantage, but despite making significant investments in the early development stage eventually lost the industry as the investment required for taking the technology to market ultimately came from overseas.

44. Our inquiry into bioengineering investigated the UK's international competitiveness in this field and sought to understand what factors had the strongest impact on the success or failure of bioengineering. We chose three areas for scrutiny: (1) the strength of the UK's research base; (2) how well research was being translated; and (3) how regulation impacted on research and translation. The scope of bioengineering was huge, so we decided to use stem cells, genetically modified (GM) crops and synthetic biology to inform our inquiry. We held three oral evidence sessions on 6, 20 and 27 January 2010, where we heard from four panels of witnesses from academia, industry, regulatory bodies and Government.

45. Overall we found that the UK has an excellent research base but is still failing to maximise its potential by translating research into wealth and health. Some areas of bioengineering, such as stem cells, have clearly benefited from strong Government leadership and support, backed up by generous levels of funding from both the public and private sectors. Others, such as genetically modified (GM) crops, are less well supported and funded. Regulation of bioengineering was complex and whilst generally sound in theory, did not always work well when put into practice. The researchers we spoke to

60 "Sceptics' homeopathy 'overdose'", *BBC news online*, 30 January 2010, news.bbc.co.uk

61 "Bioengineering" House of Commons Science and Technology Committee press notice No. 12, Session 2008–09, 4 November 2009

62 HC (2008–09) 50-I, ch 3

during our evidence sessions reported that the operation of regulations around stem cells and GM crops inhibited the successful development of applied and marketable technologies.[63]

46. In the case of emerging technologies—such as synthetic biology—we found good indications that lessons had been learnt from past experiences. However, we were concerned that there was still not enough forethought regarding synthetic biology translation, a problem that, if not addressed, could well repeat the story of the UK failing to capitalise on a strong research base, thereby falling behind internationally.[64]

47. We recommended that the Government maintain basic research funding, invest more in the early translation stages of bioengineering and improve regulatory regimes both at home and in Europe. We also considered that, if the Government picked bioengineering as part of a strategic prioritisation exercise, crucial problems in translation would need to be addressed in order for the strategy to be successful.[65]

Geoengineering

48. Geoengineering describes various activities that are specifically and deliberately designed to effect a change in the global temperature, with the aim of minimising or reversing human made global warming. These techniques largely fall into two main categories: those that aim to reduce atmospheric carbon dioxide levels, such as promoting the growth of oceanic algae that use carbon, and those that try to lower the amount of solar radiation reaching the Earth's surface, such as the injection of reflective particles into the stratosphere. We had previously covered this topic in a 2009 Report, *Engineering: Turning Ideas into Reality,*[66] and we were keen to follow this up in more detail. A further motivation for pursuing this inquiry stemmed from discussions we had with the Chairman of the US House of Representatives Science and Technology Committee during a visit we made to the USA in April 2009. Congressman Bart Gordon proposed that our committees holding parallel inquiries on a common topic. We later identified geoengineering as a topic that would benefit from such an approach. This joint working of a Parliamentary committee with its counterpart in another country is a novel and significant innovation and we discuss it further in chapter 5.

49. We decided that our inquiry would focus specifically on the regulatory aspects of geoengineering and we issued a call for evidence on this on 5 November 2009.[67] We held one oral evidence session on 13 January 2010, where we heard from three panels of witnesses. As three of our witnesses, Dr Jason Blackstock, Professor David Keith, and John Virgoe, were not in the UK, they appeared before the Committee via a live video link, which allowed them to participate simultaneously from their respective locations in the USA, Canada and Australia. We also took evidence, in the conventional manner, from Sir

63 Science and Technology Committee, Seventh Report of Session 2009–10, *Bioengineering*, HC 220, Qq 52–54, 133

64 HC (2009–10), 220, p 3

65 HC (2009–10) 220, para 128

66 HC (2008–09) 50-I, ch 4

67 "The regulation of geoengineering" House of Commons Science and Technology Committee press notice No. 14, Session 2008–09, 5 November 2009

David King, the former Government Chief Scientific Adviser, Dr Maarten van Aalst, a climate specialist, Joan Ruddock, Minister of State at the Department of Energy and Climate Change (DECC), Professor David MacKay, Chief Scientific Adviser to DECC, and Professor Nick Pidgeon on behalf of the Research Councils.

50. In our Report, *The Regulation of Geoengineering*,[68] we concluded that Government, and the international community, should begin to pay attention to geoengineering now and initiate work to establish an international regulatory framework. The global nature of geoengineering interventions means they have the potential to create not only cross-border benefits, but also disputes and problems. Having a pre-established regulatory system will be vital in minimising such issues. Opening a dialogue on these issues now, which we feel should take place through the UN, will also help to focus attention on geoengineering and promote the further research that is required to test the various methods and their impacts on the Earth.

One-off sessions

Science Question Time

51. Since 2005 the science committee—either as the Science and Technology or the IUSS Committee—has been holding regular Science Question Time sessions with the Minister for Science (see paragraph 125). These follow a pattern that is derived from departmental questions on the floor of the House. Prior to a Question Time meeting we notify the minister of the topics we would like to cover during the session. We held two Science Question Times this session, on 14 October 2010 and 24 March 2010.

52. Our first science question time in October 2009 was also the first public meeting of our newly re-established Committee. On this occasion we made a slight change to the normal format by also inviting the Government Chief Scientific Adviser, Professor John Beddington, to give evidence alongside the Minister for Science and Innovation, Rt Hon Lord Drayson. The topics we covered during this session were: the Government's actions on the recent swine flu outbreak; the role of science advice across government; research funding; and employment arrangements for academic researchers.[69]

53. Our next Science Question Time, with Lord Drayson as the sole witness, took place on the 24 March 2010 and was our last public session before the general election. In keeping with the previously established procedure we informed the Minister of the issues we would like to discuss with him beforehand. These were: the operation of the Ministerial Committee on Science and Innovation; an appraisal of the Office for Life Sciences; the recommendations made in a recent report on the UK's research base by the Council for Science and Technology;[70] and the Government's approach to encouraging green

68 Science and Technology Committee, Fifth Report of Session 2009–10, *The Regulation of Geoengineering*, HC 221

69 Science and Technology Committee, *Setting the Scene on Science and Engineering and Technology Issues Across Government: Oral and Written Evidence* HC (2009–10) 1001-i

70 The Council for Science and Technology, *A Vision for UK Research*, March 2010

incentives in industry. We were also at this session able to question the Minster on the newly published principles of scientific advice to Government.[71]

Research councils

54. The previous Science and Technology Committees, and our direct predecessor, the IUSS Committee, maintained a strong interest in the management and operation of the Research Councils. On 2 December 2009 we held a one-off oral evidence session with Professor Alan Thorpe, the Chairman of Research Councils UK (RCUK), the umbrella organisation for all the UK's Research Councils. We questioned Professor Thorpe on the how RCUK would respond to any future cuts to the science budget and how the Councils were preparing to negotiate and manage any funding changes.[72]

Responsive inquiries

Spending cuts to science and research

55. In his Pre-Budget Report published on 9 December 2009 the Chancellor announced an intention to cut £600 million from the budgets for higher education and science and research.[73] As this measure ran counter to statements often made by the Government on the economic value of investing in science and no explanation was given as to where the axe would fall, we decided to hold an inquiry into the issue of funding cuts on science education and scientific research. We announced our inquiry and call for evidence on 13 January 2010[74] and received 89 written submissions. We held three evidence sessions on 3, 10 and 24 February 2010, where we heard from five panels consisting of a total of 18 witnesses. These included representatives from all the major UK university groups, the Research Councils, practising academics, learned societies, and senior civil servants and ministers.

56. During this inquiry it became evident to us that, while the economic benefits of a strong domestic science base are widely acknowledged, the problems in producing a direct or meaningful quantification of this left the science budget in danger of being undervalued in Whitehall. Although, as mentioned above, the Government has often stated its belief in the value of investing in science, a strong case needed to be made for even maintaining the current level of spending. The prospect of cuts were not only at odds with the Government's previous statements but also with the actions taking by other countries such as the USA and France which have rightly identified investment in basic research as a tool to stimulate economic growth.

71 Letter from Lord Drayson to the Chairman of the Committee regarding the impact of spending cuts on science and scientific funding, 22 March 2010; "Principles of scientific advice to government published", BIS Press Release, 24 March 2010

72 Science and Technology Committee, *The work of the UK research councils: oral and written evidence 2 December 2009, Professor Alan Thorpe*, HC (2009–10) 102-i

73 HM Treasury, *Pre-Budget Report: Securing the recovery: growth and opportunity*, December 2009, Cm 7747, p 110

74 "The impact of spending cuts on science and scientific research", House of Commons Science and Technology Committee press notice No. 8, Session 2009–10, 13 January 2010

57. In our Report, *The impact of spending cuts on science and scientific research*,[75] we expressed our concerns that the Government was taking the mistaken view that "applied" research could be strategically invested without a commensurate increase in the "pure/blue skies" research base that underpins it. Such a restructuring would not only be detrimental to the UK economy, but would also undo a significant portion of the benefits built up by a decade of strong investment in science. A large focus of our Report was on the concept of impact—the prediction of future economic benefit arising from a research project—and we were concerned that many researchers were seemingly under the impression that impact had a prominent role in assessing grant applications. In their evidence to us the Research Councils stated that this was not the case, and we advised them to address this misunderstanding.[76] Of greater concern to us was that measures of impact were being wrongly considered in Whitehall as a potentially powerful means of ensuring the highest level of pay-back from research funding, something we did not find any evidence for.[77] Although an impact assessment can be a useful and interesting exercise, it is an inappropriate first-order measure to use in the allocation of research funds.

58. The evidence we heard during this inquiry led us to conclude that, if the UK was to be a strong player in new technologies, a sector that will likely form a major part of our future economy, it is essential to have a broad base of more theoretical investigator-led research to support it. We concluded that maintaining a broad portfolio of excellent research should not be mutually exclusive with identifying and capitalising upon areas in which the UK has the potential for world-leading science.[78]

Principles on independent scientific advice

59. One of the defining science debates of the 2009-10 session has been on the relationship between the Government and its independent scientific advisers. The issue came to the fore following the sacking of the Chairman of the Advisory Council on the Misuse of Drugs (ACMD), Professor David Nutt, by the Home Secretary, Rt Hon Alan Johnson MP. This sparked a reaction from the scientific community, and on 6 November 2009 a group of senior scientists suggested a set of principles that it thought government ministers should abide by in terms of the treatment of independent scientific advice and advisers.

60. Lord Drayson, the Science Minister, accepted the principles in principle, and began a consultation on them with a view to the Government producing its own set of principles this year. Our December 2009 Report *The Government's review of the principles applying to the treatment of independent scientific advice provided to government* was our response to that consultation.[79]

61. Since then, the debate has moved on apace. The draft set of principles were published on 15 December 2009 and we commented on them in a letters to Lord Drayson on 13

75 Science and Technology Committee, Sixth Report of Session 2009–10, *The Impact of Spending Cuts on Science and Scientific Research*, HC 335-I

76 HC (2009–10) 335-I, para 34

77 HC (2009–10) 335-I, para 35

78 HC (2009–10) 335-I, para 41

79 Science and Technology Committee, Third Report of Session 2009–10, *The Government's review of the principles applying to the treatment of independent scientific advice provided to government*, HC 158-I

January and 3 March 2010. We raised four concerns—on academic freedom, the suggestion that advisers and ministers should reach a "shared position", the notion of respect and trust, and whether the principles will be enshrined in the Ministerial Code. The first two have been accepted in the statement of principles published by the Government on 24 March 2010. We are disappointed that the third has been rejected and the fourth is still under consideration.[80] **We recommend that after the general election the Prime Minister enshrines the principles applying to the treatment of independent scientific advice provided to government in the new Ministerial Code.**

University of East Anglia

62. The unauthorised release of e-mails from the Climatic Research Unit (CRU) at the University of East Anglia (UEA) in November 2009 lead to serious allegations of collusion in support of human made global warming and scientific misrepresentation by prominent climatologists. Following a correspondence between our Chairman and the Vice-Chancellor of UEA, we decided to hold a short inquiry. The terms of reference we decided on were designed to look into: the implications of the disclosures for the integrity of scientific research; an appraisal of the terms of reference and scope of the independent review, chaired by Sir Muir Russell; and the integrity of the other two international temperature data sets commonly used by climate science scientists.

63. Our call for evidence was announced on 22 January 2010 and we held an oral evidence session on 1 March 2010 during which we heard from nine witnesses spread across five panels.[81] Witnesses included: the scientist at the heart of the allegations, Professor Phil Jones, the Director of the Climatic Research Unit at UEA; UEA's Vice-Chancellor, Professor Edward Acton; Sir Muir Russell, the chair of the Independent Climate Change Email Review; Rt Hon Lord Lawson of Blaby, Chairman of the Global Warming Policy Foundation; Richard Thomas, the former information commissioner, and Professor John Beddington, the Government Chief Scientific Adviser.

64. Any inquiry on this issue was going to raise a certain degree of controversy. We were clear from the start that we were investigating the specific events surrounding the disclosure of the e-mails and their implications, if any, on CRU's scientific integrity and not whether climate change was real or not. This was clarified by our Chairman in a statement issued on 1 February.[82]

65. Our Report reached three broad conclusions. First, that the focus on Professor Jones and CRU in relation to the science that they carried out was largely misplaced: most of the criticisms that could be levelled at them could be equally and more properly levelled at the climate science research community as a whole. Second, that the focus on Professor Jones and CRU in relation to the Freedom of Information requests was also largely misplaced: they did not receive sufficient or proper support from the University. Third, that climate science has a great responsibility in terms of providing the planet's decision makers with

80 "Principles of scientific advice to government published", BIS Press Release, 24 March 2010

81 "The disclosure of climate data from the Climatic Research Unit at the University of East Anglia", House of Commons Science and Technology Committee Press Notice No. 9, Session 2009–10, 22 January 2010

82 House of Commons Science and Technology Committee Press Notice 11, Session 2009–10, 1 February 2010

the knowledge that they need to secure our future and that this responsibility means that the knowledge on which these kinds of decisions are taken had better be right; the quality and transparency of the science must be irreproachable.

Conclusion

66. It has been an eventful session for our Committee, which was only re-established in its present form at the beginning of October 2009. We have published nine reports[83]—including this one—and have held 15 public evidence sessions since the summer recess. The proximity of the forthcoming 2010 general election, at which many of our active members will be standing down, has focused our minds to achieve as much as possible in the time we have had. Several of our Reports have received widespread media attention and two of our inquiries in particular—on homeopathy and the climate e-mails from the University of East Anglia—have been reported worldwide. In keeping with the traditions of our predecessor committees we have not shied away from controversy and have strived to take a reasoned and objective approach when tackling controversial subjects.

83 Listed at the end of this report

4 The impact of science and technology scrutiny in the House of Commons

67. Over the years, the various science and technology committees have produced many influential reports that have shaped policy decisions and legislation and re-framed debates on scientific issues relevant to society. While they have examined existing policies, the committees have all also sought to anticipate the impact of science by identifying emerging areas of interest and concern. The wide-ranging remit has been extremely valuable in allowing science and technology committees to address subjects that combine technical issues with important political, ethical and financial considerations.

68. Here, using some relatively recent examples, we explore the impact of the science and technology committees in stimulating or influencing significant changes in legislation and informing public debate on important issues. These inquiries illustrate the benefits that have arisen from having a sustained focus on science and technology.

Reproductive technologies

69. One of the most controversial topics in modern day science policy has been the use—and alleged abuse—of biotechnology. Each development in this rapidly evolving area has the capability to generate new ethical and resource, legislative and regulatory considerations and the committees have consistently recognised that such issues warrant close parliamentary scrutiny. By routinely investigating the impacts of emerging technologies they have covered many aspects of biotechnology, such as animal cloning,[84] regulatory frameworks,[85] the use of genetic data by the insurance industry,[86] genetically modified foods,[87] the manipulation of DNA[88] and human reproductive technologies and embryonic research.[89]

70. Of these, the most contentious areas are arguably the technological intervention into the process of human reproduction and the use of certain biological materials—for example embryos—in medical research. Balancing strongly held and opposing moral views, as well as considering the potential societal benefits and risks arising from new techniques, such as IVF treatments and stem cell based therapies, has proved to be an

84 Science and Technology Committee, Fourth Report of Session 1997–98, *The Cloning of Animals from Adult Cells*, HC 1039

85 Science and Technology Committee, Fifth Report of Session 1997–98, *British Biotech,* HC 888-I; Science and Technology Committee, Fourth Report of Session 1998–99, *The Regulation of the Biotechnology Industry,* HC 535; HC (2009–10) 220

86 Science and Technology Committee, Second Report of Session 1996–97, *Association of British Insurers' Policy statement on Life Insurance and genetics*, HC 328; Science and Technology Committee, Fifth Report of Session 2000–01, *Genetics and Insurance,* HC 174

87 Science and Technology Committee, First Report of Session 1998–99, *Scientific Advisory System: Genetically Modified Foods,* HC 286-I

88 Science and Technology Committee, First Report of Session 1978–79, *Recombinant DNA Research – Interim Report,* HC 355

89 Science and Technology Committee, Fourth Report of Session 2001-02, *Developments in Human Genetics and Embryology*, HC 791; Science and Technology Committee, Fifth Report of Session 2004–05, *Human Reproductive technologies and the law*, HC 7-I; Science and Technology Committee, Fifth Report of Session 2006–07, *Government proposals for the regulation of hybrid and chimera embryos*, HC 272-I; HC (2009–10) 335-I

especially contentious and complicated area of legislation, not least because the complexity of cell biology and technical nature of many of the scientific techniques make clear ethical and policy judgments difficult. Formulating legislation capable of adequately regulating areas such as stem cell research must involve the consideration of a comprehensive body of evidence. A clear example of how the Committee's work has contributed to the legislative process in this respect can be drawn from its 2005 Report on *Human Reproductive Technologies and the Law,*[90] and also its 2007 report on *Government Proposals for the Regulation of Hybrid and Chimera Embryos*.[91]

71. The Committee announced its intention to hold the first of these inquiries, into the law concerning Human Reproductive Technologies, in October 2003. Its view was that this area of legislation required significant revision and that the regulatory framework—last comprehensively addressed in 1990—was fully not keeping pace with modern technological developments. Following this lead the Government announced its own review of the relevant legislation, *The Human Fertilisation and Embryology Act*, in January 2004, stating that the Committee's inquiry would help inform its revisions.[92] A significant development in this area of medical science was the emerging potential for using cells derived from human embryos as a basis for research into stem cell based therapies. Although amended in 2001 to allow for therapeutic cloning using embryonic stem cells to research the causes and potential cell therapies of various diseases,[93] the original 1990 legislation did not reflect the breadth of new advances in this area of research and was becoming increasingly outdated.

72. The Committee collected evidence from a wide range of sources and, in addition to 12 public evidence sessions, visits were made to hospitals in the UK, to Stockholm and Rome and also to the Vatican. As the law governing fertilisation and embryology touches on many other issues, such as child welfare, abortion, donor anonymity and ethical principles, these were also included within the scope of the inquiry. As such, the resulting body of evidence, used to inform the Committee's recommendations, was far reaching and covered several areas relating to the ethical, clinical, regulatory and scientific aspects of reproductive technologies. A second report, on the regulation of hybrid embryos,[94] was undertaken following the publication of the Government's proposals for future regulation and sought to investigate the relationship between new technological developments in the field of embryology and any future regulatory changes.

73. The recommendations made by the Committee in these two reports, on a highly complex policy area, were strongly reflected in the suggested revisions made by the Government in its White Paper[95] and also in the final Act.[96] Some of the key recommendations made that subsequently appeared in the amended legislation include:

90 HC (2004–05) 7-I

91 HC (2006-07) 272-I

92 HC Deb, 21 January 2004, col 61WS

93 Human Fertilisation and Embryology (Amendment) Bill, 2001

94 HC (2006-07) 272-I

95 Department of Health, *Review of the Human Fertilisation and Embryology Act*, Cm 6989, December 2006

96 Human Fertilisation and Embryology Act 2008

- that the regulations regarding human embryos should be based on their usage and not their origin;[97]
- that the creation of hybrid or admixed (mixed animal-human) embryos should be allowed for disease related research purposes, but should be subject to strict controls, such as being kept for no longer than 14 days and their implantation being prohibited;[98]
- a recognition of the inappropriateness of the "need for a father" clause and the need to extend the definition of who may be made legal parents of donor conceived children;[99] and
- that donors should have access to non-identifying information regarding any children resulting from their donation(s), thereby balancing the rights of donors with donor conceived children.[100]

74. These inquiries provided the clearest examples of how a committee with relevant "in house" expertise, a broad remit and the appetite to tackle complex areas of legislation can make significant contributions in the development of informed scrutiny and effective draft legislation. **Having a parliamentary committee on science and technology is extremely valuable for two reasons. First, elected Members come at science and technology issues from a unique angle, bringing values and judgments to science and engineering policy scrutiny that differ from those bought by expert committees of, for example, academics or industrialists. Second, having a select committee of Members who have some expertise or interest in science and technology is extremely valuable to both the House and to Government, because it helps to highlight political issues where science or engineering expertise is valuable and, most importantly, aggregates expert advice on important issues and presents it to the House and to Government.**

Research Infrastructure Funding

75. Since its establishment in 1966, the subject that has most frequently concerned the Committee is the size and administration of the UK's science budget (see Table 1). This has led to a sustained interest in the activities of the relevant Research Councils, the organisations ultimately responsible for administering public research funds. In recent years the Committees have held regular oral evidence sessions with the incoming Chairs and Chief Executives of Research Councils and funding bodies[101] and 14 inquiries have

97 Human Fertilisation and Embryology Act 2008, section 1

98 Human Fertilisation and Embryology Act 2008, section 4

99 Human Fertilisation and Embryology Act 2008, section 14

100 Human Fertilisation and Embryology Act 2008, section 24

101 Innovation, Universities, Science And Skills Committee, Ninth Report of Session 2000–09, *Pre-appointment hearing with the Chair-elect of the Science and Technology Facilities Council, Professor Michael Sterling FREng*, HC 88; Sixth Report of Session 2008–09, *Pre-appointment hearing with the Chair-elect of the Biotechnology and Biological Sciences Research Council, Professor Sir Tom Blundell,* HC 506; Fifth Report of Session 2008–09, *Pre-appointment hearing with the Chair-elect of the Economic and Social Research Council, Dr Alan Gillespie CBE*, HC 505; Science and Technology Committee, Eight Report of Session 2006–07, *Chairman of the Medical Research Council: Introductory Hearing,* HC 746; Oral evidence given before the Science and Technology 25 April 2007, *Chief Executive of the Natural Environment Research Council: Introductory Hearing*, HC 471-i

directly investigated their internal workings and organisation.[102] By consistently scrutinising the size and administration of the UK science budget, the Committee has been able to identify areas at risk of neglect and propose workable solutions. A clear example of such a case is the funding provision for developing and maintaining research infrastructure.

76. In session 1996–97 the Science and Technology Committee inquired into *The Research Council System: Issues for the Future*.[103] This Report highlighted a critical flaw in the existing funding streams with respect to the procurement of one-off capital investments for large research infrastructure. The problem was subsequently taken up and addressed in more detail in *The Dearing Report*,[104] a comprehensive review into higher education commissioned by the Government and published a few months after the Committee's Report, which also noted this to be an area of concern and made some specific recommendations on addressing capital investments for research infrastructure. Many of the reforms suggested by the Dearing Report—concerning not only research infrastructure, but also other areas of university funding—involved the expenditure of considerable amounts of public money. While the Government formulated its own detailed response to these, the Committee decided to hold another inquiry, *The Implications of the Dearing Report for the Structure and Funding of University Research.*[105] During this inquiry the Committee heard evidence about how any new investments could be most effectively and practically implemented.

77. Recommendations made by the Committee sought to address not only the immediate crisis in the UK's research infrastructure, but also the problem of too few long-term funding streams being available for maintaining large facilities. In line with the Committee's and Dearing's recommendations the Government acted to alleviate the accumulated shortfall in capital funding by establishing, in 1998, the Joint Infrastructure Fund (JIF), a £750 million partnership between the Government and the Wellcome Trust. The investment was deemed successful and in 2002, JIF was replaced with the even more ambitious Science Research Investment Fund (SRIF), a fund of over £3 billion for infrastructure costs. In 2008, SRIF was replaced by a new Capital Investment Fund, which was designed to create a sustained solution to maintaining research infrastructure.

78. Along with the Dearing Report, the Committee was active in putting the issue of research infrastructure on the map. Subsequent decisions to act on these concerns and recommendations have substantially changed the research landscape in the UK.

102 For example, Science and Technology Committee, Third Report of Session 1968–69, *The Natural Environment Research Council*, HC 400; Third Report of Session 1996–97, *The Research Council System: Issues for the Future*, HC 309-I; Third Report of Session 2005–06, *Research Council Support for Knowledge Transfer*, HC 995-I

103 Science and Technology Committee, Fourth Report of Session 1996–97, *The Research Councils System: Issues for the Future*, HC 309-I

104 The National Committee of Inquiry into Higher Education, *Higher Education in the Learning Society ("The Dearing Report")*, July 1997

105 Science and Technology Committee, First Report of Session 1997–98, *The Implications of the Dearing Report for the Structure and Funding of University Research*, HC 303-I

Low carbon sources of energy: carbon capture and storage

79. The very first inquiry by the original Science and Technology Committee, held in 1966–67, investigated the UK's impending choice of a new nuclear reactor for power generation.[106] The 1966–1979 Committee often concerned itself with energy issues, focussing on current topics, such as generating plant breakdowns,[107] the on-going procurement of large nuclear power infrastructure,[108] and also looking forward to future issues, such as the development of renewable energy technologies.[109] Since a "departmental" energy committee was established in 1979, the recent science and technology committees—from 1992 onwards—have focussed less on current issues in energy policy but have continued to look into emerging technologies for the generation of energy by either renewable sources, such as wind[110] and tidal,[111] or by other low carbon methods such as carbon capture and storage (CCS).[112] Technological developments in these areas are crucial to meeting the UK's obligations, under the Climate Change Act 2008, to move towards a low carbon economy.

80. Of the technologies capable of providing low carbon power, CCS has been widely proposed as one of the most viable. The Committee first approached the issue of CCS (at the time generally known as 'carbon sequestration') during a report in session 2002–03, *Towards a Non-Carbon Fuel Economy: Research, Development and Demonstration.*[113] Recommendations made included that CCS was likely to be "a necessary part of the transition to a non-carbon fuel economy"[114] and that "policy mechanisms are needed to ensure that it happens".[115] CCS was then re-visited by the Committee in session 2005–06, in its report on *Meeting UK Energy and Climate Needs: The Role of Carbon Capture and Storage.*[116]

81. Evidence from both of these inquiries led the Committee to the conclusion that CCS had significant potential in assisting the UK to meet its obligations in reducing carbon emissions and that it would also help address global aspects of the climate change problem by developing an exportable technology that could be implemented in countries such as

106 HC (1966–67) 381

107 Science and Technology Committee, First Report of Session 1969–70, *Generating Plant Breakdowns: Winter 1969–70*, HC 223-I

108 HC (1966–67) 381-xvii; Science and Technology Committee, Fourth Report of Session 1968–69, *United Kingdom Nuclear Power Industry*, HC 401; Science and Technology Committee, Second Report of Session 1972–73, *Nuclear Power Policy*, HC 350; Science and Technology Committee, First Report of Session 1973–74, *The Choice of a Reactor System*, HC 73

109 HC (1976–77) 534-I; Science and Technology Committee, Fourth Report of Session 1976–77, *The Exploitation of Tidal Power in the Severn Estuary,* HC 564; Science and Technology Committee, Seventh Report of Session 2000–01, *Wave and Tidal Energy*, HC 291

110 HC (2000–01) 291

111 Innovation, Universities, Science and Skills Committee, Fifth Report of Session 2007–08, *Renewable electricity-generation technologies*, HC 216-I

112 Science and Technology Committee, First Report of Session 2005–06, *Meeting UK Energy and Climate Needs: The Role of Carbon Capture and Storage,* HC 578-I

113 Science and Technology Committee, Fourth Report of Session 2002–03, *Towards a Non-Carbon Fuel Economy: Research, Development and Demonstration*, HC 55-I

114 HC (2002–03) 55, para 110

115 HC (2002–03) 55, para 111

116 HC (2005–06) 578

China, whose growing emissions could eclipse any reductions made by the UK. The inquiry on CCS examined the economic, technical, geological and logistical aspects of CCS technology and, as such, provided a comprehensive overview of its potential benefits and limitations.

82. Since the Committee has been active on this subject:

- the Government has in 2007, announced a competition to design and build the world's first full scale CCS demonstration facility;[117]
- the Government has matched EU funding of €180 million for a CCS plant in Yorkshire, October 2009;[118] and
- if enacted, the Energy Bill 2010 would formalise in law a position to support CCS schemes.

83. The shift in political attitudes towards climate issues over the past decade has thrown into sharp relief the need for rapid advancements in low carbon technologies. The Committee has, we believe, been instrumental in encouraging investment into research and development programmes and has provided useful recommendations to Government about where funding can most wisely be directed.

Others areas of influence

84. There are a number of other areas on which we could have focussed in this Report. For example:

- In 2000 and 2002 the Committee published reports on the Government's cancer strategy. At this time survival rates for cancer in UK were amongst the lowest of any developed country. The first report, *Cancer Research—a fresh look,*[119] contained many recommendations that were subsequently adopted in a new cancer strategy, the *NHS Cancer Plan.*[120] The second, *Cancer Research—a follow up,*[121] investigated the implementation of these commitments. The acceptance of a key recommendation made in the first report, that "the Government should increase funding for [...] cancer research to at least a level to match that provided by research charities",[122] led to significant increases in public spending on cancer research. In the follow-up report the Committee scrutinised the destination of these new funds and concluded: "We are not convinced that the [increased funding] is really being spent on research alone"[123] and called for greater clarity in NHS accounts. The Health Secretary later announced an emergency audit of £320 million of cancer research funds[124] to ensure that they were

117 Department of Trade and Industry, *Meeting the Energy Challenge: A White Paper on Energy*, Cm 7124, May 2007

118 "Britain's first carbon capture and storage plant to be built in Yorkshire", *The Guardian*, 16 October 2009, p 33

119 Science and Technology Committee, Sixth Report of Session 1999–2000, *Cancer Research—A Fresh Look,* HC 332-I

120 Department of Health, *The NHS Cancer plan: a plan for investment, a plan for reform*, September 2000

121 Science and Technology Committee, First Report of Session 2001–02, *Cancer Research—A Follow-up,* HC 444

122 HC (1999–00) 332-I, para 134

123 HC (2001–02) 444, para 11

124 "Audit ordered to find £320m cancer funds", *The Guardian*, 16 January 2003

being spent appropriately. In being able to hold inquiries both prior to, and following, the formulation of the new cancer strategy the Committee made substantial contributions to informing the new policy and in ensuring its successful execution.

- In 2003 the Committee conducted an inquiry into light pollution and its effect on UK astronomy.[125] Although not an issue high on the political agenda, this gave a voice to the growing public feeling that some intervention had become necessary on this unregulated area. The Report's recommendation "that obtrusive light should be made a statutory nuisance"[126] was accepted by Government and Parliament in the 2005 Clean Neighbourhoods and Environment Act.[127]

- An inquiry in 2006 into an EU directive that would severely limit the use of MRI scanners exposed "the failure of policy makers to seek comprehensive scientific advice early in the policy formulation process and to commission the necessary research to inform this process"[128] and demonstrated that effective scrutiny could also be exercised on EU policies that have significant effects on UK society. The enforcement of the directive was subsequently postponed and the EU is currently reviewing the content.[129]

- A 2007 inquiry, *Investigating the oceans,* exposed a significant under-appreciation of the importance of the oceans to the Earth's natural systems and the value of encouraging marine research, concluding "that a new co-ordinating body for marine science [...] be established."[130] In January 2010 the Natural Environment Research Council announced the creation of the National Oceanography Centre, a facility to promote and coordinate marine research efforts.[131]

- In 2008 amendments were tabled in the House to amend the 1967 Abortion Act. The Committee had previously recommended that a cross-House committee be established to consider the scientific, medical and social changes relating to abortion in the past few decades[132] and as this had not happened it decided to conduct its own review, producing a report in 2007 on the *Scientific Developments Relating to the Abortion Act 1967*.[133] Some of the amendments were debated and given a free vote in the House and the Committee's Report was designed to provide members with as much clear evidence as possible when deciding how to vote. A key proposed amendment was a reduction of the time limit for allowing an abortion from 24 weeks. In the Report the Committee showed that no clear evidence existed for a significant increase in survival rates before

125 Science and Technology Committee, Seventh Report of Session 2002–03, *Light Pollution and Astronomy*, HC 747-I

126 HC (2002–03) 747, para 146

127 Clean Neighbourhoods and Environment Act 2005, section 102

128 Science and Technology Committee, Fourth Report of Session 2005–06, *Watching the Directives: Scientific Advice on the EU physical agents (electromagnetic fields) directive*, HC1030

129 EU Press release announcing the postponement of the electromagnetic field directive issues on 26 October 2007, europa.eu/rapid

130 Science and Technology Committee, Tenth Report of Session 2006–07, *Investigating the oceans*, HC 470-I, para 132

131 "New national centre covers marine science from the coast to the deep ocean", NERC Press Release, 2 February 2010, www.nerc.ac.uk

132 HC (2004–05) 7-I, para 308

133 Science and Technology Committee, Twelfth Report of Session 2006–07, *Scientific Developments Relating to the Abortion Act 1967*, HC 1045-I

this time (and therefore the threshold of viability)[134] and the 24 week limit was subsequently maintained by the House.[135]

Conclusions: a change of culture?

85. The motivations of the many Members who argued for the establishment of the first science and technology committee in the 1960s stemmed from a perceived disparity between the growing significance of science to public life and the ability of Parliament to engage properly with scientific issues. As the years following the Second World War saw many of the technical achievements made in the name of the war effort turned to civilian uses—such as advances in nuclear physics applied to electricity generation—science had become a more significant factor in many political decisions. Referring to this situation during a debate on House reform in 1963 Rt Hon Sir Lionel Heald QC MP, a former Attorney General in Churchill's cabinet, commented:

> [this] is a fundamental point. I believe that the House is not sufficiently equipped to deal with technical and scientific matters. [...] It is important to point out that the present rate of exchange in scientific advance is so rapid that the pure scientist and the layman are drifting further and further apart every day.[136]

86. Over the latter half of the 20th century, breakthroughs in medical treatments and farming methods led to dramatic increases in life expectancy and food production; and developments in communication and information systems changed the face of business, education and the way in which people interacted with each other.

87. But it has not all been progress. The relationship between science and policy and also science and the media took a battering during the 1990s and 2000s, in which there were a series of political and public science-related storms. There was the BSE crisis, during which the scientific advisory system became concerned with politics and lost its focus on the science.[137] As a result, public trust in the treatment and delivery of scientific advice declined and this probably played a role in how the public reacted to the media reporting of concerns about the MMR vaccine and GM crops.[138]

88. Inevitably, the societal impact of science and engineering has been reflected in parliamentary business. Data gathered by Dr Ian Gibson, a former MP and Chairman of the Science and Technology Committee, and Dr Ana Padilla, who at the time was Dr Gibson's researcher, indicate that between 1988 and 1999 the number of parliamentary questions asked on science or technology issues rose from around 0.5% to 6% (see Table 2).[139]

134 The Committee did not find clear evidence for increased survival below 23 weeks: HC (2006–07) 1045-I, para 35.

135 HC Deb, 20 May 2008, cols 275, 278 and 286

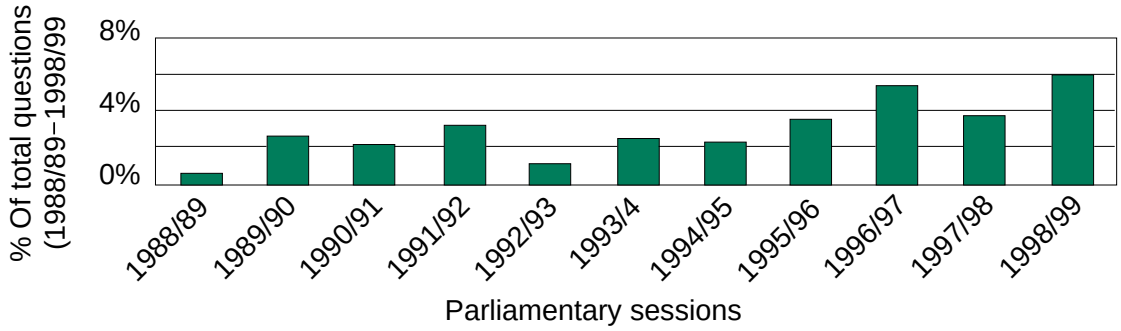
136 HC Deb, 15 March 1963, col 1761

137 *The BSE Inquiry: Findings and Conclusions*, October 2000, Volume 1, Chapter 13, section 1184

138 Paul Bellaby, "Communication and miscommunication of risk: understanding UK parents' attitudes to combined MMR vaccination", *British Medical Journal*, vol 327, (2003), pp 725–28; Stephen Hunt and Lynne Frewer "Impact of BSE on attitudes to GM food", *Risk Decision and Policy*, vol 6, (2001), pp 91–103

139 Ana Padilla and Ian Gibson, "Science moves to the centre stage", *Nature*, 2000, vol 403, pp 357–359

Table 2 Science and technology questions in Parliament by year (1989–1999) represented as a percentage of all parliamentary questions (from Padilla and Gibson 2000)



89. Since the 1990s, there has also been a shift in the way that science is used in Government. In 1997 the Chief Scientific Adviser to the Government, Sir Robert (now Lord) May published Guidelines on *The Use of Scientific Advice in Policy Making* outlining key principles which should be applied across Whitehall.[140] This was partly a reaction to recent events, such as the BSE crisis, which had cast doubt on the rigour of the advisory system. The "May Principles" encouraged departments to: "draw on a sufficiently wide range of the best expert sources, both within and outside Government", "involve at least some experts from other [...] disciplines to ensure that the evidence is subjected to a sufficiently questioning review" and to assume a "presumption towards openness in explaining the interpretation of scientific advice".[141] Although supportive of these, the Science and Technology Committee noted in 2000 that "the need to make explicit principles which seem self-evident is perhaps an indication that all was not well with the scientific advisory system".[142] In session 1998–99 the Committee decided to explore how widely these principles were being applied through a series of inquiries which would examine four separate policy areas: GM foods,[143] mobile phones and health,[144] diabetes and driving licences[145] and scientific advice on climate change.[146] A fifth report[147] in the series then drew on the experiences of these inquiries and made specific recommendations to how the system as a whole should be reformed.

140 Chief Scientific Adviser/Office of Science and Innovation, *Guidelines On Scientific Analysis In Policy Making*, October 2005

141 Chief Scientific Adviser/Office of Science and Innovation, *Guidelines On Scientific Analysis In Policy Making*, October 2005, paras 6 and 12

142 Science and Technology Committee, Fourth Report of Session 2000–01, *The Scientific Advisory System*, HC 257, para 1

143 HC (1998–99) 286-I

144 Science and Technology Committee, Third Report of Session 1998–99, *Scientific Advisory System: Mobile Phones and Health,* HC 489-I

145 Science and Technology Committee, Third Report of Session 1999–2000, *Scientific Advisory System: Diabetes and Driving Licences,* HC 206-I

146 Science and Technology Committee, Third Report of Session 2000–01, *Scientific Advisory System: Scientific Advice on Climate Change*, HC 14

147 HC (2000–01) 257

90. This final report—*The Scientific Advisory System*—was published at a time when several other important changes were being made to the way government worked: the 2000 Freedom of Information Act had provided a statutory obligation for openness; a series of publications, such as those from the Cabinet Office[148] and the OST,[149] were providing more specific guidelines in using scientific advice; the "Phillips Report"[150] on the BSE crisis had made recommendations on how the scientific advisory system could be better structured; and new over-arching advisory bodies, such as the Human Genetics Commission and Food Standards Agency, were being established. In its recommendations the Committee promoted the virtues of a system that was almost entirely transparent and in which the Government was proactive in recognising knowledge gaps and commissioning research to fill them.[151]

91. The Committee's efforts in pushing for better policy making did not stop with this Report. In 2005–06, a new series of inquiries that set out to assess the use of scientific advice in policy making were launched. This time, the case studies focussed on an EU Directive that threatened the use of MRI scanning,[152] drugs classification,[153] and identity card technologies.[154] These reports culminated in a fourth report on *Scientific Advice, Risk and Evidence Based Policy Making* in 2006.[155] Among these recommendations was the suggestion that the role of the Government Chief Scientific Adviser and the Head of the Office for Science and Innovation (with responsibility for the science budget) should be split. This is what essentially happened when DIUS was formed in 2007, when the OSI was split into the Government Office for Science, which supported the Government Chief Scientific Adviser, and the Research and Innovation team, headed by the Director General for Science and Innovation (now Director General of Science and Research).

92. At various other times, the committees responsible for science have suggested that there should be closer co-operation between the Government Chief Scientific Adviser and the Departmental Chief Scientific Advisers,[156] that there should be more departmental Scientific Advisory Councils,[157] that engineering should play a more prominent role in policy making,[158] and that science and engineering expertise in the civil service should be encouraged.[159] These suggestions, and more, have been adopted by the Government and the policy-making apparatus of Whitehall continues to improve.

148 Cabinet Office, *Modernising Government*, Cm 4310, March 1999

149 The Office of Science and Technology, *The Use of Scientific Advice in Policy making*, March 1997

150 *The BSE Inquiry: Findings and Conclusions*, Volume 1, October 2000,

151 HC (2000–01) 257, paras 42 and 53–57

152 HC (2005–06) 1030

153 Science and Technology Committee, Fifth report of Session 2005–06, *Drug Classification: Making a Hash of it?*, HC 1031

154 Science and Technology Committee, Sixth Report of Session 2005–06, *Identity card technologies: Scientific Advice, Risk and Evidence*, HC 1032

155 Science and Technology Committee, Seventh Report of Session 2005–06, *Scientific Advice, Risk and Evidence Based Policy Making*, HC 900-I

156 HC (2005–06) 900-I, para 41

157 HC (2008–09) 168-I, para 54

158 HC (2008–09) 50-I, para 265

159 HC (2005–06) 900-I, paras 45–61

93. **The various science and technology committees went about their business in the context of public opinion and government action, and since the mid 1990s in the context of wider efforts to promote evidence based policy making and transparency. However, these committees have made a major contribution to specific changes, and probably wider cultural changes, in the use of science in policy making. It would be going too far to say that science and technology committees set the Government in the right direction—there were other forces at play—but it is clear that they provided a healthy 'push' mechanism for improving the status of science, engineering and technology in Government.**

5 Innovations of the Science and Technology Committee

94. The first Science and Technology Committee pioneered some aspects of the way in which select committees work today. For example, the 1966–67 Committee, under the Chairmanship of Arthur Palmer MP, made full use of the discretion given to it by the House to hold evidence sessions in public, something that was not an accepted norm at the time but has since become standard practice. It also, after considerable confrontation with the Government, won the right to travel and hear evidence from whom it wished[160] (see paragraph 9). As both the Science and Technology Committee and the Innovation, Universities, Science and Skills (IUSS) Committee, we have attempted to continue to innovate, pushing the boundaries to make our scrutiny of government more effective.

Joint working

95. The great scientific and technological challenges of our time are global. Climate change, food security, water security, carbon-neutral energy, ageing populations, diseases, terrorism, financial stability and more, all of which require an international collaborative effort to find and implement solutions. Research scientists and engineers have worked in international collaborations for years; and governments likewise work to create international alliances and agreements. Parliamentary scrutiny through select committees, by contrast, has typically been focussed exclusively at a national level.

96. As we have noted, during the IUSS Committee's visit to the US in 2008, Congressman Bart Gordon and, our Chairman, Mr Phil Willis, discussed ways in which the US House of Representatives Science and Technology Committee and the UK House of Commons IUSS Committee (now the Science and Technology Committee) might work together. There are no provisions or precedents for joint working between committees from different national parliaments[161] and this presented a number of challenges to the inquiry process. We resolved these by dovetailing a small inquiry into a larger US inquiry.

97. The topic we chose was geoengineering—large scale interventions to reduce the effects of climate change. We had previously considered geoengineering in the IUSS Committee report on *Engineering: turning ideas into reality*,[162] published in March 2009. In that Report, we identified geoengineering as an emerging issue that policy-makers would have to address in the near future. The world is set to warm by an uncertain amount, even if efforts are successful in severely and rapidly curtailing carbon emissions (because of the time it takes for natural processes to remove greenhouse gasses from the atmosphere). Consequently, geoengineering has received attention from a small number of scientists and engineers for several years. It has not been discussed much in public or political domains because of fears that consideration of geoengineering would distract from mitigation

160 Michael Jogerst, *Reform in the House of Commons: The Select Committee System*, University Press of Kentucky, 1993, p 77

161 Though the Standing Orders make provisions for joint working between select committees of the House of Commons and committees of the National Assembly for Wales.

162 HC (2008–09) 50-I

efforts, in much the same way as discussion of adaptation to climate change was seen as controversial in previous decades. However, the stark dangers of a warming climate and the need for a "Plan B" in the event of dangerous climate change, means that geoengineering, for good or ill, will be a topic of great importance in the near future.

98. Following the IUSS Committee's Report, the Royal Society published, on 1 September 2009, the findings of a major study into geoengineering the climate, *Geoengineering the climate: science, governance and uncertainty*. This study provided a detailed assessment of the various methods and considered the potential efficiency and unintended consequences they might pose. One area that the Royal Society report identified as requiring examination was the need to develop adequate international mechanisms to regulate geoengineering. It noted the importance of identifying where regulatory gaps existed in relation to geoengineering methods and of the need to establish a process for the development of mechanisms to address these gaps.

99. When drawing up our joint programme with the House Committee, we took the Royal Society's recommendations into consideration. The House Committee was conducting an inquiry on geoengineering—its first exploration of the topic—while we carried out a complementary inquiry on the regulatory aspects of geoengineering. The evidence we gathered and our Report is intended to inform the House Committee's deliberations.

100. Running the dovetailed inquiries was relatively straightforward and took place according to plan. Within the procedural constraints we worked together sharing publicly available papers and kept in close contact. The following arrangements were adopted:

- the staff of each Committee were in regular contact with one another and shared information on geoengineering;
- all Commons Committee memoranda and transcripts were sent to the US Committee once reported to the House of Commons;
- all House Committee papers were sent to the Commons Committee once reported to the Committee Clerk;
- the Commons Committee's Report contained a chapter drawing on the experience of two Committees working together with recommendations on arrangements for future coordination; and
- the Chair of the Commons Committee testified on 18 March 2010 on the conclusions and recommendations in the Commons Committee Report to the House Committee, which was treated as testimony to the House Committee.[163]

101. Looking to the future we set out in the Report a number of conclusions and recommendations to assist committees carrying out collaborative work with committees from other national legislatures. One change we suggested was that collaborative working between legislatures House of Commons committees should request the committee with which collaboration is taking place to provide a "permanent" witness—either an official or

163 HC (2009–10) 221, para 116

member of the committee—to provide oral evidence via video link at all oral evidence sessions.

102. **Science, engineering and technology are key to solving global challenges. Only through international collaboration will these challenges be met with success. We suggest that the next Science and Technology Committee should continue the working relationship with the US House of Representatives Science and Technology Committee. It should also consider making working connections with other international committees.**

Evidence Check

103. The timing of the re-establishment of the new Science and Technology Committee, in October 2009, so close to the end of Parliament, meant that we had very little time to conduct inquiries and produce reports. We thereafter decided that:

a) it would be important to make a prompt start, minimising the amount of time required to get oral evidence sessions underway;

b) we should use the time we had in the session 2009–10 as productively as possible, preferably with built in flexibility so that emerging issues could be tackled and if issues did not emerge the programme would still be full;

c) the public should be more fully engaged in our work; and

d) our predecessor committees' focus on evidence based policy making should be retained.

104. Typical inquiries do not necessarily meet all of these criteria. We therefore devised a new type of inquiry that we dubbed "Evidence Check".

105. In July 2009 we, as the IUSS Committee but in anticipation of becoming the Science and Technology Committee, wrote to the Government asking for statements on 10 different policy areas, asking two questions: (1) what is the policy? and (2) on what evidence is the policy based? We also issued a call for suggestions for topics to consider for future Evidence Checks. By issuing the initial call for evidence over recess it meant that when the new Committee formed in October we were able to avoid losing time by waiting for evidence to be submitted. The call for evidence asked specifically about evidence based policy making; covered 10 topics so that a range of policy areas as considered and so that we would have a range of options; and, crucially, it enabled us to select inquiries having already seen written evidence from the Government. Additionally, the public call for suggestions made the public more prominent stakeholders in future Evidence Check inquiries.

106. When we became the Science and Technology Committee in October 2009, we reviewed the Government's responses and selected two topics to take further: (1) early literacy interventions and dyslexia (two topics which we were able to roll into one having seen the Government's response); and (2) the licensing and NHS provision of homeopathy (an expanded topic following our initial question to the Government, which was on licensing; see also paragraphs 34 to 42).

107. One of the key benefits of this process was that not only did we have the opportunity to take into account the Government's published position on a range of policy issues before selecting which ones required further scrutiny, but also that people submitting memoranda to the inquiries we selected were able to do so having already seen the Government's response, which meant that the submissions we received were sharply focussed on Government policy. Additionally, by keeping the remits tight, we were able to select two topics, which meant we could cover more policy ground and still leave open the opportunity to do a third inquiry, following a later call for evidence (see also paragraph 35).

108. While we were conducting the first two Evidence Checks, we considered the public's suggestions for inquiries and issued a second set of topics for Government consideration. This approach gave us good coverage of policy issues across a range of Government departments, with a particular focus on topics with lots of public interest. It also gave us the flexibility to decide quite late in our programme about what topics we should consider for a third Evidence Check or if we should focus our attention on something else. In the end, following a series of announcements on current and future cuts to the science budget, we decided to conduct an inquiry on science spending cuts.

109. We found the Evidence Check process to be exactly what we designed it for: flexible, focussed and fast. We were able to produce two topical reports that put the process by which government makes policy under a fine microscope. This was important scrutiny work that was applicable to more than just the topics considered: it struck right at the heart of what good policy making is all about: proper consideration of the evidence.

110. **We recommend our Evidence Check approach to other select committees as a mechanism for conducting fast, focussed and reactive inquiries.**

Popularising the scrutiny process

111. As elected representatives, the scrutiny role that we play is performed on behalf of our constituents. In this sense, the role of the select committee in scrutinising the work of government is inherently democratic. We have taken steps—we discuss three here—to improve the 'democratic content' of the select committee scrutiny process by engaging more with stakeholders and the wider public.

Links with the community

112. The science and engineering community played a critical role in the re-establishment of the Science and Technology Committee.[164] We felt that it was important to engage the community with our work and decided to hold a seminar to discuss the future work of the Committee. On 21 October 2009, we met with 18 people from learned societies, professional institutions, government and Parliament. The Chairman, on behalf of the Committee, also engaged the wider community via Twitter, which we discuss below. We asked people to identify areas of work that the Committee should consider in the session before the 2010 general election and what issues they considered would be important to science in the next few years.

164 Letters to the Editor, *The Guardian*, 20 July 2007, p 41; see also paragraphs 26 and 27.

113. A range of suggestions and concerns were raised during the seminar.[165] Among the issues discussed were the role of government and industry, concerns about the fragility of the science base and science funding and international competitiveness of UK science and science-based industry. We found the discussion to be extremely useful, and it has informed two of our inquiries—bioengineering and science funding cuts.

114. **We found bringing together key stakeholders to discuss options and priorities for our future work programme to be extremely useful. We suggest that running an annual informal seminar along the same lines as our 2009 seminar would be useful for our successor committee.**

"Have your say"

115. In February 2009, the IUSS Committee launched "Subjects for scrutiny: have your say", an engagement programme that gave members of the public an opportunity to make suggestions of topics that would make good oral evidence sessions. We discussed this innovation in our First Report of this session.[166] We, as the IUSS Committee, found that process to be very useful—both in terms of the suggestions for inquiry topics and also because it had the effect of engaging the public more in the work of the Committee—and we have continued that approach.

116. In July 2009, we asked for suggestions in relation to the Evidence Check programme. Because of time constraints and competing priorities, we were unable to use these suggestions to pursue a third Evidence Check, but we did use them to:

a) make an additional call for evidence to the Government on a range of topics;

b) inform the work of our existing Evidence Checks (for example, on homeopathy); and

c) inform other aspects of our work (for example, on science funding cuts).

117. Most importantly, this process opened up engagement with a group of people who normally did not engage with select committee inquiries. We greatly valued input from, and engagement with, members of the public.

118. **We have found consultation with the public on subjects for scrutiny to be extremely valuable. The process benefits members of the public, who become stakeholders in select committee work. Select committees benefit from a large pool of timely suggestions from which to choose, and from a more engaged public. Evidence Check is a good vehicle for this kind of engagement.**

The use of social media

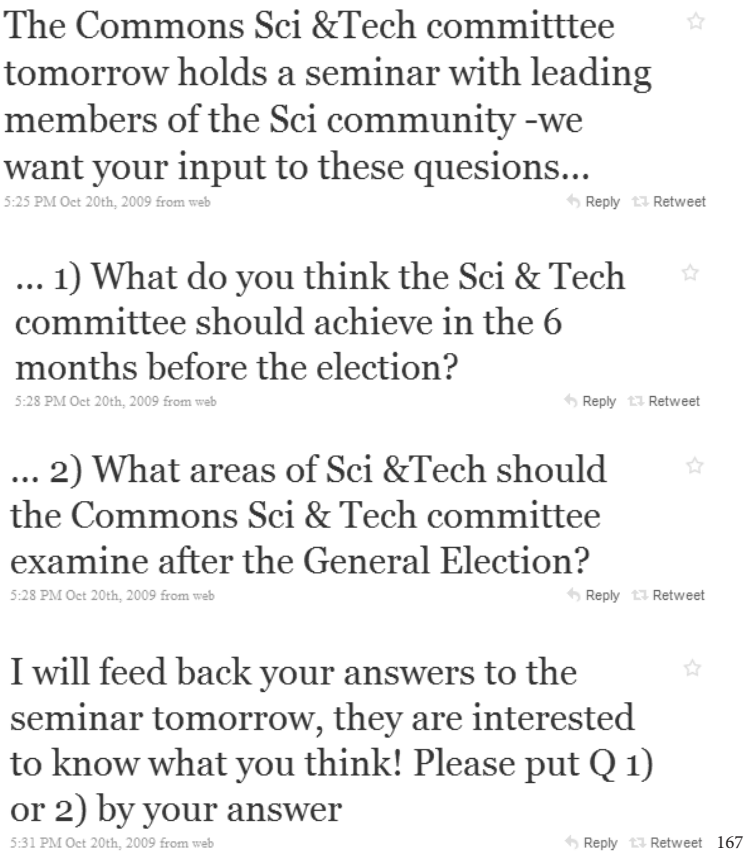
119. Social media has gone, in the space of only a couple of years, from the sole domain of the young and a computer-savvy elite, to mainstream use. The most immediate, conversational and popular of these new social media tools is currently Twitter, a service

165 Science and Technology Committee, First Report of Session 2009–10, *The work of the Committee in 2008–09*, HC 103, Annex 2

166 HC (2008–09) 103

which allows the rapid communication of short messages to whomever wishes to receive or access them. We have made use of Twitter as part of our efforts to widen the appeal and improve the scrutiny process.

120. For example, prior to our October 2009 seminar on the future programme we tweeted two questions from the Chairman's account (@philwillismp):



167

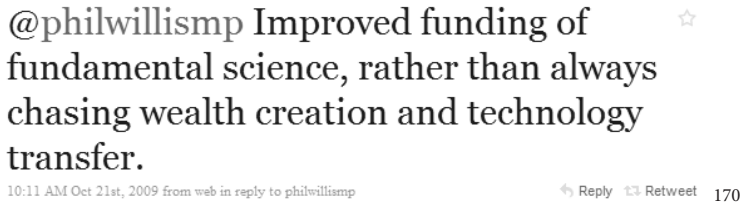
121. We received dozens of responses.[168] For example:

169

167 twitter.com/philwillismp/status/5021980484; twitter.com/philwillismp/status/5022030369; twitter.com/philwillismp/status/5022045465; twitter.com/philwillismp/status/5022097381

168 In the Twitter lexicon the text "@philwillismp" indicates that the message is being sent for the attention of that person (in this case to Phil Willis MP)

169 twitter.com/markianwallace/status/5038305995



170

We fed these useful suggestions back into the seminar for discussion.

122. In addition, we have also noticed an increasing volume of social media interaction during oral evidence sessions, with informative discussion and even sensible suggestions for follow up questions for witnesses. For example, during the homeopathy inquiry, #evcheck became a popular hash-tag for following the oral evidence sessions remotely. A Google search of "site:twitter.com #evcheck" on 12 March 2010 returned 1170 hits.

123. During an oral evidence session on bioengineering, one of our members, Mr Ian Cawsey MP, made use of Twitter and commented:

> Earlier in this session we spoke about public opinion. [...] It is interesting that this morning since it was decided I would ask about GM and it was twittered out a whole series of comments has been twittered back to me which talk about Frankenstein-like food, allowing nature to be messed with, the declining bee population and that if you kick nature it will kick back. That has happened within just a few minutes.[171]

124. **The immediacy of new social media poses interesting challenges: Members will need to use these tools with discretion as there is a need to bear in mind existing principles of parliamentary process and the House may in due course need to consider whether guidelines are needed. However, we consider that social media provides considerable opportunities. For example, it could potentially be useful in the questioning of witnesses and, most importantly, it engages the public in select committee proceedings.**

Science Question Time

125. In 2005, our predecessor Science and Technology Committee instigated Science Question Time, a form of oral evidence session arranged with the Science Minister, then Lord Sainsbury of Turville. As Lord Sainsbury was a member of House of Lords there was no established system which allowed members of the House of Commons to question him on his ministerial activities. The Committee sought to address this by creating Science Question Time. The first session started with the then Chairman Dr Ian Gibson MP addressing Lord Sainsbury:

> Lord Sainsbury, thank you very, very much for coming. [You] know the questions and the areas and if you can just reply, like you do in the Chamber to questions that

170 twitter.com/sciencebase/status/5040260340

171 Science and Technology Committee, Uncorrected transcript of oral evidence taken on 27 January 2010, HC (2009–10) 220-iii, Q213

> are written down, then somebody will reply from our side and will ask a supplementary question. I will try and restrict each question to about five minutes.[172]

126. This style of questioning—the Minister is made aware of a few questions prior to the session, statements are prepared, read to the Committee and followed up by supplementary questions—remains at the heart of Science Question Time today, although the number of questions and thus the length of time on each question differs.

127. Following Lord Sainsbury's departure from Government in November 2006, Science Question Time continued with Malcolm Wicks, but it did not survive the Science and Technology Committee which was disbanded in October 2007. However, upon the appointment of Lord Drayson as Science Minister, Science Question Time was reinstated, with the first session taking place in January 2009.

128. **We found Science Question Time to be a valuable part of the scrutiny of the Government's use of science and engineering in policy making. We commend this format to our successor committee.**

Young people

129. Written memoranda and oral evidence are usually only received from established professional individuals and senior representatives of organisations. In effect, that means we almost exclusively receive evidence from people who are more than 30 years old, and mostly over 50 years old. In effect, the nature of the inquiry process as it is currently implemented excludes the views of younger people. We have taken some small steps to rectify this situation. Two examples stand out from our brief time as the IUSS Committee.

130. During the engineering inquiry,[173] we took oral evidence in 2008 from a panel of young engineers who ranged in age from school children to early career engineers. We found this to be a useful exercise, especially when contrasted with a panel of more senior engineers.

131. We also took part in the Big Bang Fair, which was a major event held in London in March 2009 to inspire young people about science and engineering. We held an informal oral evidence session with a group of children, but we reversed the process. The children were asking the questions and four of our number were in the witness seats answering the questions. We reported that:

> We were delighted to take part in this imitation committee session and to engage directly with school children about these issues. The pupils were enthusiastic and assertive and did not shy away from tackling controversial and complex subjects.[174]

132. **The views of young people will frequently be relevant to select committee inquiries and, when they are, they should be sought out. Measures to raise the general level of young people's engagement in, and awareness of, the work of committee, such as the**

172 Science and Technology Committee, *Science Question Time: oral evidence from Lord Sainsbury taken on 2 March 2005*, HC (2004–05) 250-i, Q1

173 HC (2008–09) 50-I

174 HC (2009–10) 103, para 53

Big Bang Fair, are very valuable in stimulating an interest amongst those who may go on to provide us with evidence in the future.

September visits

133. For a number of years, the Chairman, sometimes with other members, has conducted a series of visits, during a week in September. Within the Committee they have become known as "the September visits". They are a valued part of our agenda and are, we believe, valued by the science and engineering community.

134. The key purpose of the visits is to build relationships between the Committee and stakeholder communities. Since 2005, we have used this annual programme to visit a range of individuals and establishments around the UK, including the Sanger Institute, Sellafield, Daresbury and numerous universities, and to establish effective working relationships with professional and learned societies, the Research Councils and central Government. The September visits have also proven a valuable source of intelligence on the ever-changing science and engineering landscape, and a useful mechanism for following up previous inquiries.

135. **We have found the September visits very useful as a way of forging effective relationships with stakeholders, gathering intelligence and following up past inquiries. Private meetings have a different dynamic to public evidence sessions and provide valuable additional knowledge to the Committee.**

Conclusions

136. Since the first committee in the 1960s the Science and Technology Committee in the House of Commons has been in the vanguard of innovation. We hope that we have upheld and built on this tradition.

Conclusions and recommendations

Science and technology parliamentary scrutiny

1. We recommend that in the new Parliament there should be a committee responsible for scrutinising science, engineering and technology across government. We make three suggestions on how this committee should be formed: (1) it should have the prime responsibility for scrutiny of the Government's science unit and science minister, whatever the unit is called and wherever it lies; (2) it should be a freestanding committee with a cross-departmental remit; and (3) it should have a membership of 11 and a quorum of three. (Paragraph 31)

Evidence check 1: Early Literacy Interventions

2. We were disappointed that the Government failed to engage with our Report on early literacy interventions in a constructive manner. Either our concerns were right and the Government should have explained how it will take steps to improve its processes, or our concerns were misplaced and the Government should explain why. Avoiding important issues is unacceptable. (Paragraph 39)

Principles on independent scientific advice

3. We recommend that after the general election the Prime Minister enshrines the principles applying to the treatment of independent scientific advice provided to government in the new Ministerial Code. (Paragraph 61)

The impact of science and technology scrutiny in the House of Commons

4. Having a parliamentary committee on science and technology is extremely valuable for two reasons. First, elected Members come at science and technology issues from a unique angle, bringing values and judgments to science and engineering policy scrutiny that differ from those bought by expert committees of, for example, academics or industrialists. Second, having a select committee of Members who have some expertise or interest in science and technology is extremely valuable to both the House and to Government, because it helps to highlight political issues where science or engineering expertise is valuable and, most importantly, aggregates expert advice on important issues and presents it to the House and to Government. (Paragraph 74)

5. The various science and technology committees went about their business in the context of public opinion and government action, and since the mid 1990s in the context of wider efforts to promote evidence based policy making and transparency. However, these committees have made a major contribution to specific changes, and probably wider cultural changes, in the use of science in policy making. It would be going too far to say that science and technology committees set the Government in the right direction—there were other forces at play—but it is clear that they provided a healthy 'push' mechanism for improving the status of science, engineering and technology in Government. (Paragraph 93)

Innovations of the Science and Technology Committee

6. Science, engineering and technology are key to solving global challenges. Only through international collaboration will these challenges be met with success. We suggest that the next Science and Technology Committee should continue the working relationship with the US House of Representatives Science and Technology Committee. It should also consider making working connections with other international committees. (Paragraph 102)

7. We recommend our Evidence Check approach to other select committees as a mechanism for conducting fast, focussed and reactive inquiries. (Paragraph 110)

8. We found bringing together key stakeholders to discuss options and priorities for our future work programme to be extremely useful. We suggest that running an annual informal seminar along the same lines as our 2009 seminar would be useful for our successor committee. (Paragraph 114)

9. We have found consultation with the public on subjects for scrutiny to be extremely valuable. The process benefits members of the public, who become stakeholders in select committee work. Select committees benefit from a large pool of timely suggestions from which to choose, and from a more engaged public. Evidence Check is a good vehicle for this kind of engagement. (Paragraph 118)

10. The immediacy of new social media poses interesting challenges: Members will need to use these tools with discretion as there is a need to bear in mind existing principles of parliamentary process and the House may in due course need to consider whether guidelines are needed. However, we consider that social media provides considerable opportunities. For example, it could potentially be useful in the questioning of witnesses and, most importantly, it engages the public in select committee proceedings. (Paragraph 124)

11. We found Science Question Time to be a valuable part of the scrutiny of the Government's use of science and engineering in policy making. We commend this format to our successor committee. (Paragraph 128)

12. The views of young people will frequently be relevant to select committee inquiries and, when they are, they should be sought out. Measures to raise the general level of young people's engagement in, and awareness of, the work of committee, such as the Big Bang Fair, are very valuable in stimulating an interest amongst those who may go on to provide us with evidence in the future. (Paragraph 132)

13. We have found the September visits very useful as a way of forging effective relationships with stakeholders, gathering intelligence and following up past inquiries. Private meetings have a different dynamic to public evidence sessions and provide valuable additional knowledge to the Committee. (Paragraph 135)

Formal Minutes

Wednesday 24 March 2010

Members present:

Mr Phil Willis, in the Chair

Mr Tim Boswell	Dr Brian Iddon
Dr Evan Harris	Graham Stringer

The Legacy Report

The Committee considered this matter.

Draft Report (The Legacy Report), proposed by the Chair, brought up and read.

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

Paragraphs 1 to 136 read and agreed to.

Summary agreed to.

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

Ordered, That the Chair make the Report to the House.

[The Committee adjourned

List of Reports from the Committee during the current Parliament

The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

Session 2009–10

First Report	The work of the Committee in 2008–09	HC 103
Second Report	Evidence Check 1: Early Literacy Interventions	HC 44 (HC 385)
Third Report	The Government's review of the principles applying to the treatment of independent scientific advice provided to government	HC 158–I (HC 384)
Fourth Report	Evidence Check 2: Homeopathy	HC 45
Fifth Report	The Regulation of Geoengineering	HC 221
Sixth Report	The impact of spending cuts on science and scientific research	HC 335–I
Seventh Report	Bioengineering	HC 220
Eighth Report	The disclosure of climate data from the Climatic Research Unit at the University of East Anglia	HC 387–I
Ninth Report	The Legacy Report	HC 481

Session 2008–09

First Report	Re-skilling for recovery: After Leitch, implementing skills and training policies	HC 48–I (HC 365)
Second Report	The Work of the Committee 2007–08	HC 49
Third Report	DIUS's Departmental Report 2008	HC 51–I (HC 383)
Fourth Report	Engineering: turning ideas into reality	HC 50–I (HC 759)
Fifth Report	Pre-appointment hearing with the Chair-elect of the Economic and Social Research Council, Dr Alan Gillespie CBE	HC 505
Sixth Report	Pre-appointment hearing with the Chair-elect of the Biotechnology and Biological Sciences Research Council, Professor Sir Tom Blundell	HC 506
Seventh Report	Spend, spend, spend? – The mismanagement of the Learning and Skills Council's capital programme in further education colleges	HC 530 (HC 989)
Eighth Report	Putting Science and Engineering at the Heart of Government Policy	HC 168–I (HC 1036)
Ninth Report	Pre-appointment hearing with the Chair-elect of the Science and Technology Facilities Council, Professor Michael Sterling	HC 887
Tenth Report	Sites of Special Scientific Interest	HC 717 (HC 990)
Eleventh Report	Students and Universities	HC 170–I (HC 991)

Session 2007–08

First Report	UK Centre for Medical Research and Innovation	HC 185 (HC 459)
Second Report	The work and operation of the Copyright Tribunal	HC 245 (HC 637)
Third Report	Withdrawal of funding for equivalent or lower level qualifications (ELQs)	HC 187–I (HC 638)
Fourth Report	Science Budget Allocations	HC 215 (HC 639)

Fifth Report	Renewable electricity-generation technologies	HC 216–I (HC 1063)
Sixth Report	Biosecurity in UK research laboratories	HC 360–I (HC 1111)
Seventh Report	Pre-legislative Scrutiny of the Draft Apprenticeships Bill	HC 1062–I (HC (2008–09)262)
First Special Report	The Funding of Science and Discovery Centres: Government Response to the Eleventh Report from the Science and Technology Committee, Session 2006–07	HC 214

Session 2007–08 (Continued)

Second Special Report	The Last Report: Government Response to the Thirteenth Report from the Science and Technology Committee, Session 2006–07	HC 244
Fourth Special Report	Investigating the Oceans: Government Response to the Science and Technology Committee's Tenth Report of Session 2006–07	HC 506 [incorporating HC 469–i]