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Science and Technology
Committee

**Legacy—Parliament
2010–15**

Ninth Report of Session 2014–15

*Report, together with formal minutes relating
to the report*

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Science and Technology Committee

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

All publications of the Committee (including press notices) and further details can be found on the Committee's web pages at www.parliament.uk/science

Current membership

[Andrew Miller](#) (*Labour, Ellesmere Port and Neston*) (*Chair*)

[Dan Byles](#) (*Conservative, North Warwickshire*)

[Jim Dowd](#) (*Labour, Lewisham West and Penge*)

[Mr David Heath](#) (*Liberal Democrat, Somerton and Frome*)

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[Graham Stringer](#) (*Labour, Blackley and Broughton*)

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The following members were also members of the committee during the parliament:

Gavin Barwell (*Conservative, Croydon Central*)

Caroline Dinenage (*Conservative, Gosport*)

Gareth Johnson (*Conservative, Dartford*)

Gregg McClymont (*Labour, Cumbernauld, Kilsyth and Kirkintilloch East*)

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Jonathan Reynolds (*Labour/Co-operative, Stalybridge and Hyde*)

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Chair's foreword

At the end of the 2005-10 Parliament, new rules governing the appointment of select committee chairs and members were agreed which came into force after the 2010 general election. I am confident that those rules have impacted positively on the working of committees in general and the science and technology committee in particular.



Whilst science policy is rarely Party political, over the years we have dealt with a number of controversial issues and have, where justified, criticised Ministers. However, all but two of our reports have been unanimous and, as a committee, we have never divided on political grounds. I put this down to a combination of the impact of the new rules and the commitment of colleagues to approaching our work based upon the evidence presented to us.

I want to put on record my thanks for the collegiate approach members have taken towards their responsibilities even when they have dealt with matters that have the potential of embarrassment to their Party.

It is clear that some of our work referred to in this Report has had a real impact on Government and research council thinking. The Government, learned societies, academics and industry recognise this and we touch on our effectiveness in chapter 3. This has been possible because of the strong networks we have been able to create across the science community and I have no doubt that this would have been much harder had it not been for the skills of the committee staff, all of whom, past and present, are a credit to Parliament. Having a number of staff with scientific qualifications has also been important and I strongly take the view that the House would benefit from having more clerks and committee specialists with such backgrounds.

We have, as this Report sets out, covered science issues across a number of government departments, but a significant amount of work has focussed on the Government Office for Science and the Department for Business, Innovation & Skills. With that in mind, I also want to put on record my thanks to the previous science Minister and government chief scientist, David Willets and Sir John Beddington. Both of them built on the work of their predecessors in a positive manner and co-operated with our inquiries, each setting a high bar for their successors.

We often hear about the failure of Parliament to properly address scientific issues, usually by people who have little grasp of how policy is made. However, in reality there are a greater number of colleagues who have at some stage in their careers worked in a scientific, technological, engineering or mathematical discipline. The House is also ably supported by the Parliamentary Office of Science & Technology (POST) as well as the Parliamentary & Scientific Committee. The latter is the oldest All Party Parliamentary Group and celebrated

its 75th birthday in Buckingham Palace, hosted by its former president HRH Prince Phillip. Voices of the Future, Parliamentary Links Day and SET for Britain are all now established parts of the parliamentary calendar and select committee members play an active part in them. Having listed all these, we cannot be complacent: science is advancing so fast that we need to strengthen our links with the world of science to help Parliament keep up to date with developments.

Finally, as this is the last report I will contribute to as a Member of Parliament, I want to emphasise the importance of work done in select committees. It is poorly covered by the media but is, in reality, an important tool in Parliament's armoury in keeping a check on a government that has enormous resources at its disposal. I hope our successor committee takes on the challenges with the same vigour and in the same spirit as we did!

A handwritten signature in black ink that reads "Andrew Miller". The signature is written in a cursive style. Below the name, there is a short horizontal line.

1 Introduction

1. As the end of the 2010-2015 Parliament approaches, we have taken the opportunity to look back on our work. This Report outlines some of the Committee's work, progress and effectiveness during this Parliament and sets out areas that may be of interest to our successor committee. It has, of course, also given us the opportunity to scrutinise what actions the Government has taken with regard to issues and recommendations raised in our reports and to seek updates and explanations in respect of responses to those reports.

2. Our responsibility is to scrutinise the Government Office for Science and consequently we may examine any issue relating to how that department facilitates the use of science, scientific advice and evidence and technology across all government departments. We have held inquiries covering a range of policy areas, including practical science experiments and field trips¹, malware and cyber crime,² medical implants,³ marine science⁴ and scientific advice and evidence in emergencies.⁵

3. The table below sets out headline figures reflecting the more tangible elements of our work:

	Session 2010–12	Session 2012–13	Session 2013–14	Session 2014–15	Total
Meetings	67	36	44	28	175
Reports	15	9	9	9	42
Special Reports	11	6	9	4	30
Witnesses	262	104	160	142	668
Inquiries	29	14	19	14	76
Written evidence	834	264	526	292	1,916

4. We have received written and oral evidence for our inquiries from a hugely diverse range of stakeholders, and we are grateful for the time and effort they have taken to contribute to our work. We have also benefitted from having committee staff with strong

¹ Science and Technology Committee, Ninth Report of Session 2010–12, [Practical experiments in school science lessons and science field trips](#), HC 1060-I

² Science and Technology Committee, Twelfth Report of Session 2010–12, [Malware and cyber crime](#), HC1537

³ Science and Technology Committee, Fifth Report of Session 2012–13, [Regulation of medical implants in the EU and UK](#), HC 163

⁴ Science and Technology Committee, Ninth Report of Session 2012–13, [Marine science](#), HC 727

⁵ Science and Technology Committee, Third Report of Session 2010–11, [Scientific advice and evidence in emergencies](#), HC 498

scientific backgrounds as they have been able to assist us with the more detailed aspects of our work. One of the principal aims of our work is to ensure that government policy is as well informed and evidence-based as possible, and it is only thanks to the written and oral evidence that we receive from stakeholders and the input of our scientifically qualified staff that we can achieve this aim.

5. For this legacy inquiry, we have focused our efforts and resources on those government departments that have most frequently featured in our inquiries and on those inquiries for which we consider there is a high level of public interest. We have not included our most recent inquiries because our reports or the Government's official responses have only very recently been published⁶. We issued a call for written evidence on the following terms of reference:

- a) Has the Government made progress in those areas it agreed with Committee recommendations?
- b) Where the Government agreed with the principles of the Committee's conclusions but not the recommended approach, has the Government introduced alternative approaches that have worked?
- c) Are there issues raised during the Committee's inquiries still unresolved?
- d) Have Committee reports had an impact in raising issues that may otherwise have been neglected.
- e) Have Committee reports had an influence outside of Government? For example on the policy and practice of industry and universities?

6. We received 20 pieces of written evidence and held three oral evidence sessions with the Government Chief Scientific Adviser and Government Ministers representing the following departments:

- a) Department for Business, Innovation & Skills
- b) Department for Education
- c) Department for Environment, Food & Rural Affairs
- d) Department of Health
- e) Government Office for Science
- f) Home Office

7. In addition, we sought written updates on our relevant reports from the Cabinet Office and the Department for Energy and Climate Change. We would like to thank everyone for their contribution to this inquiry.

⁶ GM foods and application of the precautionary principle in Europe; Current and future uses of biometric data and technologies; National Health Screening; Social media data and real time analytics

8. This Report is broken down into three sections. Chapter 2 sets out a range of key themes emerging from the evidence we have received during this Parliament and that we consider to be particularly important. Chapter 3 considers some of the Committee's achievements, both from a policy and operational perspective. The annexes consider, in more detail, the work, since our inquiries, of the government departments referred to above and set out a number of areas where those departments still have significant work to do.

2 Key themes from Parliament 2010-2015

Foundations for the effective use of science in government

9. The means through which scientific advice and evidence most effectively informs policymaking has been a recurring theme of our work during this Parliament. Despite some progress, there are still improvements to be made across government, in particular regarding the scientific advice structures in government and the use of evidence in policymaking.

Scientific advice structures

10. The need for effective scientific advice structures in government and the provision of well-informed, accurate and timely scientific advice and evidence in policymaking has been evident in many of our inquiries. The annexes of this Report touch on a number of areas for improvement in this regard. We see a need to strengthen the scientific advice infrastructure across Government.

11. In our reports, we have supported the conclusions of predecessor committees that the Government Office for Science would be more effective if it were located in the Cabinet Office. We have seen several instances where a stronger voice from the centre of government would have had a more powerful influence than is possible from a department within BIS.⁷

12. We have considered the role of Chief Scientific Advisers (CSA) both within departments and as a network of advice across government. We have found that policy is often adversely impacted if a department does not have a CSA in post;⁸ if it does not fully involve the CSA in all policy changes to ensure that they are informed by effective scientific advice and evidence;⁹ if CSAs and senior officials cannot dedicate sufficient time to their science brief;¹⁰ and when practices for appointing CSAs do not ensure that the most suitable person is offered the role.¹¹

13. CSAs are often supported within departments by a system of advisory councils and committees that allow departments to draw in expertise from external science authorities. These councils and committees should adhere to standard guidance from the Government

⁷ For example, see the Department for Business, Innovation & Skills annex to this Report (p24) and Science and Technology Committee, Ninth Report of Session 2013-14, [Government horizon scanning](#), HC703, para 39-40

⁸ For example, at times the Department for Education did not have a Chief Scientific Adviser in post during reforms of A-Level practical science examinations

⁹ Science and Technology Committee, Seventh Report of Session 2012-13, [Educating tomorrow's engineers: the impact of Government reforms on 14-19 education](#), HC 665, paras 91-92; Science and Technology Committee, Seventh Report of Session 2010-12, [The Forensic Science Service](#), HC 855, para 171

¹⁰ [Oral evidence](#) taken on 10 November 2014, HC (2014-15) 640, Q15-16 [Dr Leunig]

¹¹ [Oral evidence](#) taken on 10 November 2014, HC (2014-15) 640, Q4 [Dr Leunig]; [Letter](#) to the Chair of the Science and Technology Committee from the Permanent Secretary, Department for Education and the Government Chief Scientific Adviser, Government Office for Science, 16 December 2014

Office for Science on composition, conduct and transparency. It has been illuminating to discover the diversity with which such bodies are used across departments, not always to the benefit of evidence-based policy. We noted several Ministers were unclear as to the difference between these bodies and the role which these bodies should play.¹²

14. We were particularly concerned by the arrangements in the Department of Health where the situation is made more complex by the historic position of Chief Medical Officer (CMO). Health is an obvious area in which science must inform frontline policy decisions, but Ministers demonstrated to us that they were unclear of how that policy and advice should interact.¹³ Dame Sally Davies, the current CMO and CSA for the Department of Health, is doing an excellent job of bringing health-related science issues to the public arena and ensuring their consideration. However, we have concerns that combining the two positions has the potential to blur the line between an advocate of policy and an independent adviser with a remit to challenge policy. We have made recommendations on this matter in our annex dealing with the Department of Health.

15. At European Union level, we expressed our concern to Jean-Claude Juncker, President of the European Commission, at the delay in appointing a chief scientific adviser,¹⁴ and later expressed our relief that there had not been a decision to abolish the post.¹⁵ We were encouraged that Mr Juncker had sought advice on what options were open to him “to better institutionalise future independent scientific advice to the Commission, based on the experience made in all Member States”.¹⁶

16. How the President receives independent scientific advice with respect to EU legislation may be of interest to our successor Committee.

The use of evidence in policymaking

17. We have been a strong advocate for robust scientific evidence being the basis for government policy. Despite a recent trend toward the greater use of evidence in policymaking, in certain instances, Ministers have not been able to demonstrate the use of scientific advice or evidence in important policy areas. This has been most visible in the Department for Education and the Home Office and we have expressed concerns about the position of the CSA in both departments.¹⁷ We have not conducted an inquiry into how scientific advice and policy is utilised across the whole of government but it is a theme our successor committee may wish to remain vigilant to during the next Parliament. **Our successor committee may wish to consider such an inquiry early in the next Parliament**

¹² See Annex 5, Department of Health, scientific advice structures

¹³ See Annex 5, Department of Health, scientific advice structures

¹⁴ [Letter to](#) the President of the European Commission from the Chair of the Science and Technology Committee, 20 November 2014

¹⁵ Letter to the President of the European Commission from the Chair of the Science and Technology Committee, 2 March 2015

¹⁶ [Letter to](#) the Chair of the Science and Technology Committee from the President of the European Commission, 16 January 2015

¹⁷ Science and Technology Committee, Seventh Report of Session 2012-13, [Educating tomorrow's engineers: the impact of Government reforms on 14-19 education](#), HC 665, paras 91-92; Science and Technology Committee, Seventh Report of Session 2010-12, [The Forensic Science Service](#), HC 855, para 171

given that it may require an extended piece of work that becomes less tenable as the Parliament progresses.

Delivering science and scientific advice

18. Even with optimised scientific advice structures in government and the consistent and robust use of evidence in policymaking, scientific advice and evidence can only be used if the necessary delivery mechanisms are in place. Over the course of this Parliament, we have become concerned that two essential components to the delivery of science have been significantly eroded, namely public spending on science and research and the integrity of our scientific infrastructure.

Spending and research

19. Throughout this Parliament our work has been set against a backdrop of challenging public finances. Although we welcomed the Government's announcement of one-off additional funding for The Royal Botanic Gardens, Kew, shortly before our evidence session on the subject, and there have been a number of welcome announcements by the Government on capital spending, we have seen reductions in science budgets affect science facilities (for example in astronomy and particle physics),¹⁸ research within government departments (for example in the Department for Education),¹⁹ and potentially threaten the existence of the British Antarctic Survey. **We are conscious that the challenging financial landscape is likely to persist for a number of years and, in light of the Government's Science and Innovation Strategy and spending review 2015 settlements, our successor committee may wish to take a more detailed look at the effects on science and technology of constrained public finances across all government departments as well as challenging the curious definition of 'science' in that strategy.**

Scientific infrastructure

20. We have been concerned by the reductions in public funding for important scientific infrastructure, to the extent that the country's long-term scientific capability may be undermined. Funding for The Royal Botanic Gardens, Kew,²⁰ astronomy and particle physics facilities,²¹ public sector research establishments,²² the National Schools Observatory²³ and the ownership and governance structure of The National Oceanography Centre, the Centre for Ecology & Hydrology and the British Geological Survey²⁴ are just some examples of risks to scientific infrastructure that we have encountered during this

¹⁸ Science and Technology Committee, Fourth Report of Session 2010-12, [Astronomy and particle physics](#), HC806

¹⁹ Q76 [Nick Gibb]

²⁰ Science and Technology Committee, Seventh Report of Session 2014-15, [Royal Botanic Gardens, Kew](#), HC 866

²¹ Science and Technology Committee, Fourth Report of Session 2010-12, [Astronomy and particle physics](#), HC 806

²² Science and Technology Committee, Eighth Report of Session 2012-13, [Bridging the valley of death: improving the commercialisation of research](#), HC 348, paras 131-137

²³ Science and Technology Committee, Fourth Report of Session 2010-12, [Astronomy and particle physics](#), HC 806, paras 117-121

²⁴ Natural Environment Research Council, ['NERC considers charitable status for new ownership model in two of its research centres'](#), accessed 26 January 2015

Parliament. Additionally, we have found that a lack of long-term funding for fundamental (data building and conservation) research poses risks to our ‘infrastructure of knowledge’, an issue we encountered particularly in respect of marine science.²⁵

21. Given continuing spending constraints, we expect that this will be an ongoing issue during the next Parliament.

‘Spreading the word’ and the future of science

22. For the effective public use and future of science, science should not operate in a government, policymaking or science community ‘silo’. Our work has repeatedly brought to light the fact that the Government has much work still to do to utilise innovative technology in the public sector, to communicate effectively scientific issues to the public and to develop the scientists and engineers of the future.

Innovation and procurement

23. The Government has laid the foundations of an improved national innovation structure during this Parliament. Innovate UK, Catapult Centres, the British Business Bank and the Small Business Research Initiative should all contribute to scientific and technological innovations and growth which would strengthen and grow the country’s science base. We have heard evidence of public sector procurement practices, for example in the National Health Service, not necessarily complementing these initiatives. Given public sector procurement power, and the knock-on benefits this can have for investment into innovative businesses, we concluded that government departments could do more to procure from and reward innovative companies, not least those that have benefited from public support.²⁶ A better understanding of the impact of Catapult centres is needed, both in terms of them driving innovation and, importantly, their impact on the availability of longer term financing. We consider this again in paragraphs 43 to 46 of this Report.

The communication of science

24. We have published several reports²⁷ that have examined the need for appropriate and effective communication of science to the public to ensure that they are sufficiently well-informed to judge government policy. In those reports, we discussed the varying roles that will be played by the media, scientists and higher education, all of whom have a responsibility to communicate science to the public. There is significant improvement to be made in this area and the Government has a central role to play in ensuring that the public can find well-written, accessible, authoritative and objective information.²⁸ Sir Mark

²⁵ Science and Technology Committee, Ninth Report of Session 2012-13, [Marine science](#), HC 727, paras 13-16 and paras 41-43

²⁶ Science and Technology Committee, Eighth Report of Session 2012-13, [Bridging the valley of death: improving the commercialisation of research](#), HC 348, paras 138-174

²⁷ *Communicating climate science*, *National health screening*, *Scientific advice and evidence in emergencies*, *Malware and cyber crime*, *Advanced genetic techniques for crop improvement: regulation, risk and precaution* and *Risk perception and energy infrastructure*

²⁸ Science and Technology Committee, Eighth Report of Session 2013-14, [Communicating climate science](#), HC 254, paras 105-110

Walport, the current Chief Government Scientific Adviser, has told us on several occasions that science is not a democracy²⁹ but science can be politicised and, if it is, then both science and the scientists that provide advice are much less valuable to government in the delivery of evidence-based policy.

25. The role of Government in leading national debate on issues such as climate change and genetically modified crops will be undermined if it cannot point to transparent, authoritative and independent science that the public can trust.

The next generation of scientists and engineers

26. A frequent concern has been that the next generation of scientists are not being as well supported or provided for as they should be.³⁰ The state of school science facilities,³¹ reforms to practical science examinations and vocational qualifications,³² the skills and number of science teachers, the conditions of laboratory technicians,³³ careers advice³⁴ and the underrepresentation of women and minority groups in science careers³⁵ are ongoing challenges to be overcome if the country is to reach its full potential in science, technology, engineering and mathematics in the future.

27. We were encouraged to hear from Nick Gibb MP, Minister of State for School Reform, that the number of pupils studying science A-Levels has increased under this Government.³⁶ However, that alone will not fulfil the Government's aspiration that the country's future be based on a knowledge economy with high quality science and engineering at its core.

28. We recommend that our successor Committee keep a watching eye on science qualifications and how schools and universities develop the scientists and engineers we so desperately need.

Conclusion

29. Despite the Government officially advocating the importance of scientific advice and evidence as a key input in the policymaking process, our work during this Parliament has demonstrated, on a number of occasions, that this is not always reflected in Government practice. The use of scientific research and analysis in

²⁹ For example, [Oral evidence](#) taken on 6 November 2013, HC (2013-14) 254, Q440 [Prof Walport]

³⁰ Science and Technology Committee, Ninth Report of Session 2010-12, [Practical experiments in school science lessons and science field trips](#), HC 1060-I; Science and Technology Committee, Seventh Report of Session 2012-13, [Educating tomorrow's engineers: the impact of Government reforms on 14-19 education](#), HC 665;

³¹ 'A message from Andrew Miller MP, Chair of Science and Technology Select Committee, to Nick Gibb MP, Minister for School Reform. Filmed at the Science Museum, London', 26 November 2014

³² Science and Technology Committee, Ninth Report of Session 2010-12, [Practical experiments in school science lessons and science field trips](#), HC 1060-I

³³ Science and Technology Committee, Ninth Report of Session 2010-12, [Practical experiments in school science lessons and science field trips](#), HC 1060-I, paras 65-69

³⁴ Science and Technology Committee, Seventh Report of Session 2012-13, [Educating tomorrow's engineers: the impact of Government reforms on 14-19 education](#), HC 665, paras 70-78

³⁵ Science and Technology Committee, Sixth Report of Session 2013-14, [Women in scientific careers](#), HC 701

³⁶ Q37

policymaking is generally understood and practised by certain departments, for example the Department of Health and the Department for Business, Innovation & Skills. However other departments, notably the Department for Education, the Department for Environment, Food & Rural Affairs and the Home Office, appear either not to appreciate the value of scientific advice and evidence in policymaking or simply do not have the capability, experience or processes in place to utilise it. This remains of great concern to us.

3 Committee effectiveness and operations

Committee effectiveness

30. Although it is difficult to definitively demonstrate what direct impact our work has had, we believe that our scrutiny work during this Parliament has had an effect, including:

- a) £2.3 million worth of extra funding for The Royal Botanic Gardens, Kew, in 2015-16, announced two days before our one-off inquiry into the subject;³⁷
- b) in July 2014, the Prime Minister's independent review of the economic issues surrounding antimicrobial resistance, announced five days before publication of our report on antimicrobial resistance;³⁸
- c) the Government funding a £97 million supercomputer for the Met Office to be based at the Met Office and Exeter Science Park;
- d) the development and publication of the Government's 'Enhanced SAGE Guidance' and, in particular, the need for increased transparency of the science advisory group for emergencies (SAGEs) which, unusually, included a specific reference to our work³⁹;
- e) the development and roll-out of the Government's 'Cyber Street' initiative;⁴⁰
- f) the acceleration and strengthening of the Health Research Authority's transparency policy for clinical trials;⁴¹
- g) maintaining the independence of, and public funding stream for, the British Antarctic Survey when it was threatened by a merger with the National Oceanography Centre;⁴²
- h) speeding up the passage of the Human Fertilisation and Embryology (Mitochondrial Donation) Regulations 2015 through the House of Commons following our one-off evidence session on mitochondrial donation;⁴³
- i) the Minister for Water, Forestry, Rural Affairs and Resource Management writing to water companies to ensure that they take a truly risk based approach to water

³⁷ Science and Technology Committee, Seventh Report of Session 2014–15, [Royal Botanic Gardens, Kew](#), HC 866, para 21

³⁸ Science and Technology Committee, First Report of Session 2014–15, [Ensuring access to working antimicrobials](#), HC 509, para 5

³⁹ HM Government, [Enhanced SAGE Guidance: A strategic framework for the Scientific Advisory Group for Emergencies \(SAGE\)](#) (2012), p23 footnote 18

⁴⁰ Science and Technology Committee, Twelfth Report of Session 2010–12, [Malware and cyber crime](#), HC1537

⁴¹ Science and Technology Committee, Third Report of Session 2013–14, [Clinical trials](#), HC 104, paras 107-110

⁴² Science and Technology Committee, Sixth Report of Session 2012–13, [Proposed merger of British Antarctic Survey and National Oceanography Centre](#), HC 699

⁴³ [Oral evidence](#) taken on 22 October 2014, HC (2014-15) 730

facilities in school science laboratories so that schools are not faced with excessive caution; and

j) ensuring proposals from Ofqual to remove the assessment of practical science from A level and GCSE examinations received proper Ministerial consideration.

31. In oral evidence to us, Greg Clark MP, Minister of State for Universities, Science and Cities, Department for Business, Innovation & Skills and Cabinet Office concluded:

I know that the work of the Committee, even when it has occasionally nudged the Government in different ways and caused a bit of controversy, is good controversy if it gets people passionate about science. I am grateful for [the Chair's] personal contribution, and for the hard work of the Committee's members.⁴⁴

Professor Sir Mark Walport, Government Chief Scientific Adviser, Government Office for Science added that:

May I take the opportunity to thank you, Chair, and the Committee for your work on science, engineering and technology, and indeed the social sciences, if I may say so, because your scrutiny is important? Your inputs are helpful. We do take notice of them.⁴⁵

32. The Royal Society told us that “the Commons Science and Technology Committee makes a vital contribution to the scrutiny of research policy and the use of science across government”⁴⁶ and that, as a Committee, we have been “particularly strong” when we scrutinise “issues which would otherwise receive little attention. In such situations its profile and the authority stemming from its evidence-based approach can act as a driving force for action”.⁴⁷ We are also reassured to hear that the effects of our work reach “the whole scientific community and its interplay with government initiatives—ensuring the scientific community asks the questions of itself that it might not otherwise ask” and that “the breadth of [our] recommendations, stretching beyond government, are welcome”.⁴⁸ Professor Sue Black, University of Dundee, said that the Committee “should be commended”⁴⁹ for its work on forensic science.

33. We are encouraged to learn that our recommendations have also resulted in tangible progress outside government, for example “the ABPI [Association of the British Pharmaceutical Industry] Code of Practice has been updated to ensure that companies adhere to prevailing transparency requirements”⁵⁰ and clinical trials disclosure toolkits, technical workshops and compliance audits have taken place.⁵¹ The Government

⁴⁴ Q272

⁴⁵ Q339

⁴⁶ The Royal Society (LEG 001) para 5

⁴⁷ The Royal Society (LEG 001) para 8

⁴⁸ The Royal Society (LEG 001) para 6

⁴⁹ BBC Radio 5 live, 5 live Daily, 4 February 2015 [Professor Black]

⁵⁰ Association of the British Pharmaceutical Industry (LEG 004) para 3.8

⁵¹ Association of the British Pharmaceutical Industry (LEG 004) para 3.4

welcomed our work on antimicrobial resistance “because it has helped to support the work the Department [of Health] is doing and to signal round the world that this country is again stepping up to the plate and leading on this”.⁵² Separately it recognised our “important work [...] in helping to explain these important issues [medical implants] to the public”.⁵³

Committee operations

34. Throughout this Parliament we have sought ways to improve the way in which the Committee operates. We were the one of the first three select committees in the House of Commons to use electronic tablets and work towards more paperless operations. We have held innovative evidence sessions which have “generated much fruitful debate”⁵⁴ and produced a ‘video letter’⁵⁵ to the Education Minister on the subject of the assessment of school practicals rather than the more usual method of producing a report. Stakeholders have welcomed “the Committee’s novel approach of organising (and filming) workshops [...] and we look forward to such approaches being used more widely”.⁵⁶

35. We endeavoured to reach and listen to as wide an audience as possible over the last five years. We visited a range of scientific facilities, for example the Met Office in Exeter, the National Oceanography Centre in Liverpool, the Fraunhofer, Helmholtz and Leibniz technology and innovation institutions in Germany and the European Organisation for Nuclear Research (CERN) in Geneva, Switzerland. We held oral evidence sessions at Falmouth University, Falmouth, the High Value Manufacturing Catapult centre, Sheffield, the Royal Botanic Gardens, Kew and the Science Museum, London. We hosted four “Voice of the Future” events on the Parliamentary estate.⁵⁷ Committee staff are considering novel ways in which the committee might engage with the science community to discuss potentially fruitful areas of inquiry at the beginning of the next Parliament.

⁵² Q19 [George Freeman]

⁵³ Department of Business, Innovation & Skills and Department of Health (LEG 011)

⁵⁴ The Geological Society (LEG 007) para 11

⁵⁵ [‘A message from Andrew Miller MP, Chair of Science and Technology Select Committee, to Nick Gibb MP, Minister for School Reform. Filmed at the Science Museum, London’](#), 26 November 2014

⁵⁶ The Geological Society (LEG 007) para 7

⁵⁷ Voice of the Future is a unique annual event organised by the Society of Biology and hosted by the Science and Technology Committee on the parliamentary estate during which young scientists have the opportunity to question members of the committee, Government Ministers and the Government Chief Scientific Adviser on all aspects of science policy and evidence-based policymaking.

Departmental annexes

36. In the annexes to this Report, we outline what progress the Government has made in addressing the issues highlighted in our reports and in the Government's responses to those reports. These annexes are not intended to be a comprehensive update on all of the Committee's reports, nor do they repeat the detailed background or context to each individual issue that is available in our original reports. Instead they capture the current state of what we consider to be important policy areas and make recommendations to the Government with regards to those.

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Cabinet Office

The census and social science

37. In our report *The census and social science*, we were concerned that social science could suffer if the census was to be discontinued without serious consideration as to how this data would be replaced.⁵⁸ The Government and the Office for National Statistics⁵⁹ recognised the unique value of the census whilst also appreciating the need to use innovative sources and methods for collecting and using social data.⁶⁰ The Right Honourable Francis Maude MP, Minister for the Cabinet Office and Paymaster General, told us that “the Government has accepted the National Statistician’s recommendation to conduct a census in 2021, where possible online, and that alongside this there should be greater use of administrative data and survey”.⁶¹ In 2014, the Government established the Administrative Data Research Network and associated research centres. In its official response to our report, the Government “noted” our recommendation that there should be specific ministerial oversight of the use social science in government policymaking. **We welcome the Administrative Data Research Network and the associated research centres but note the lack of any commitment to allocating ministerial oversight to the use of social science. It remains our position that both the commission and utilisation of social science by Government would benefit from direct Ministerial responsibility.**

⁵⁸ Science and Technology Committee, Third Report of Session 2012-13, [The census and social science](#), HC322

⁵⁹ Office for National Statistics, [The Census and Future Provision of Population Statistics in England and Wales: Recommendation from the National Statistician and Chief Executive of the UK Statistics Authority](#) (March 2014)

⁶⁰ Cabinet Office (LEG 012)

⁶¹ Cabinet Office (LEG 012)

Department for Business, Innovation & Skills

Science in government and the Government Office for Science

38. As Minister of State for Universities, Science and Cities (and, unlike his predecessor, with a role in both the Department for Business, Innovation & Skills (BIS) and the Cabinet Office) we wanted to understand whether the Right Honourable Greg Clark MP considered that his ministerial responsibility extended beyond science policy and into the use of scientific evidence and advice in wider government policymaking. He told us that “the Science Minister should have an interest in making sure [...] that the whole of Government benefits from the best quality of scientific advice”.⁶² **We agree with the Minister and urge that this same view continues within Government to ensure that scientific evidence and advice is at the heart of policymaking.**

39. During the last Parliament, both our predecessor committee⁶³ and the Innovation, Universities, Science and Skills Committee⁶⁴ recommended⁶⁵ that the Government Office for Science (GO-Science) should sit within the Cabinet Office. We have continued to champion this change⁶⁶ and there has been a notable evolution of the Government’s stance on this matter: unlike his predecessor, Greg Clark has responsibilities both in BIS and the Cabinet Office; the Government’s new horizon scanning programme is a joint Cabinet Office and GO-Science programme; following the resignation of the Government’s most senior science policy official in November 2014 from his director general role in BIS, the role was split so that the higher education element of the brief moved to a different directorate general in BIS and the science and innovation responsibilities initially moved to the Cabinet Office’s chief economist who, in February 2015, was then appointed director general for knowledge and innovation in BIS. Although, in his short time as Science Minister, Greg Clark had “not found any deficiency with the present arrangement”⁶⁷, his view was that “the role of the Government’s chief scientist [...] is unambiguously for the Government and informs the Government collectively”⁶⁸.

40. We note the piecemeal relocation of roles and responsibilities from the Department for Business, Innovation & Skills to the Cabinet Office and vice-versa and consider that it dilutes the source of scientific advice in government. We, again, strongly re-iterate our recommendation that GO-Science should sit within the Cabinet Office so that it benefits from scientific advice and evidence being at the centre of government.

⁶² Q214

⁶³ Science and Technology Committee, Seventh Report of Session 2005-06, *Scientific advice, risk and evidence based policy making*, HC900-I, para 19

⁶⁴ The science and innovation aspects of the work of Innovation, Universities, Science and Skills Committee now forms part of the work of the Science and Technology Committee

⁶⁵ Innovation, Universities, Science and Skills Committee, Fourth Report of Session 2008-09, [Engineering: turning ideas into reality](#), HC50-I, paras 312-313

⁶⁶ Science and Technology Committee, Ninth Report of Session 2013-14, [Government horizon scanning](#), HC703, paras 39-40

⁶⁷ Q209

⁶⁸ Q209

Science funding

41. Greg Clark explained to us that he regarded investment in science as “an investment in our future. It is a good investment”⁶⁹ and that he would be “making the strongest possible case in advance of the [2015] spending review”⁷⁰ to protect science funding. We note that the Government’s science and innovation strategy states that the Government:

will examine how to ensure that R&D spending by departments is properly prioritised against other capital investment spending, for example by considering controls that can be placed on this spending to ensure that valuable R&D is not unduly deprioritised in favour of short-term pressures. We will report on this by the next Spending Review.⁷¹

42. We strongly support the Minister’s position regarding science funding and urge this Government and its successor to deliver on the Minister’s commitments. Science funding and the 2015 spending review will undoubtedly interest our successor committee.

The commercialisation of research

43. In our reports on the commercialisation of research⁷² and technology and innovation centres⁷³, we considered the challenges of turning research into commercial success, and the Government’s plans to establish the necessary innovation infrastructure to support this. The national academies have recently published their key priorities and actions for the next government “to make the UK the best place in which to do research and innovation”. Greg Clark told us that our report on commercialising research “was particularly influential when drafting the Science and Innovation strategy”⁷⁴ and that the UK’s ability to commercialise research “is improving”⁷⁵. He explained that:

the British Business Bank has been established, not least to bring together what your report said was sometimes a confusing array of different initiatives available to business. It is still early days, but the signs are promising. In the first 12 months, 21,000 small and medium sized businesses have been helped by the British Business Bank. The recommendation has been adopted, it is being implemented.⁷⁶

44. As Greg Clark stated, Catapult centres,⁷⁷ knowledge transfer partnerships⁷⁸ and “growth hubs”⁷⁹ all form part of the innovation infrastructure. We note that because the

⁶⁹ Q210

⁷⁰ Q210

⁷¹ HM Treasury, Department for Business, Innovation & Skills, *Our plan for growth: science and innovation*, [Cm 8980](#), December 2014, para 4.35

⁷² Science and Technology Committee, Eighth Report of Session 2012-13, [Bridging the valley of death: improving the commercialisation of research](#), HC 348

⁷³ Science and Technology Committee, Second Report of Session 2010-11, [Technology and Innovation Centres](#), HC 619

⁷⁴ Q216

⁷⁵ Q216

⁷⁶ Q216

⁷⁷ Q242

⁷⁸ Q235

⁷⁹ Q224

“high value manufacturing Catapult [...] was oversubscribed in terms of the number of projects in which it can participate”⁸⁰ it will receive £61 million of additional government funding.⁸¹ Greg Clark stated that “early indications suggest that, where you have these instances of public funding, it brings in—it attracts; it crowds in—about 30% of additional private funding”.⁸² **We welcome the additional funding that the high value manufacturing Catapult will receive from the Government. At the same time we remind the Government that one of the intrinsic values of the Catapult centres is that they operate independently from other government research and commercialisation initiatives and higher education institutions, and should continue to do so.**

45. We have previously expressed concerns that small and innovative companies have difficulty accessing equity finance.⁸³ Greg Clark explained that he had held conversations with the London Stock Exchange about facilitating small companies’ access to equity markets and that “not only is it very much on people’s agenda but it is being acted upon”.⁸⁴ **The innovation infrastructure developed by this Government is a solid starting ground for progress to be realised. We agree with Greg Clark that it will take time to judge the success of the Government’s policies to assist businesses to commercialise research and to grow.**

46. *We recommend that the Government set out, in its response to this Report, what work is being done to increase small and innovative companies’ access to equity markets and to measure the impact of Catapult centres on increasing the finance available to SMEs, as we mention in paragraph 23 of this Report.*

Government procurement

47. In our report on the commercialisation of research,⁸⁵ we highlighted that Government is in a unique position to act as lead customer for SMEs and innovative businesses. The potential benefits are clear: SMEs win valuable custom from a large client; innovative technology could dramatically improve public services; and investors are attracted to businesses with government contracts.

48. From a low base, government contracts allotted under the Government’s Small Business Research Initiative (SBRI) are up 75% compared with 2010.⁸⁶ Greg Clark did not think that was good enough and that the Government has “further to go on it”,⁸⁷ and he told us that, in BIS, the “use of the SBRI is at 42% from SMEs, so we are making progress”⁸⁸

⁸⁰ Q242

⁸¹ HM Treasury, Department for Business, Innovation & Skills, *Our plan for growth: science and innovation*, [Cm 8980](#), December 2014, para 5.24

⁸² Q236

⁸³ Science and Technology Committee, Eighth Report of Session 2012-13, [Bridging the valley of death: improving the commercialisation of research](#), HC 348, para 42

⁸⁴ Q219

⁸⁵ Science and Technology Committee, Eighth Report of Session 2012-13, [Bridging the valley of death: improving the commercialisation of research](#), HC 348, paras 138-174

⁸⁶ Q226

⁸⁷ Q227

⁸⁸ Q230

and “BIS currently spends 30.8% of its budget on SMEs. We want to raise that. Across Government, it is just short of 20%”.⁸⁹

49. Although there has been some progress in the proportion of Government contracts awarded to SMEs and innovative businesses, there is still much progress to be made to ensure that these businesses have equal access to public sector contracts. There is an added incentive for government to procure from small businesses that it has indirectly funded, for example through Catapult centres, to ensure a positive return on the public investment.

Diversity in higher education and Catapult centres

Higher education

50. In our report on women in scientific careers⁹⁰, we expressed our concern at the under-representation of women and other minority groups in academic scientific careers. Greg Clark believes that the Government does “have a responsibility” to increase diversity in the higher education sector and that he takes “that responsibility directly and personally”.⁹¹ The higher education sector is independent of government, but Greg Clark told us that this does not mean that he “cannot make some pretty pertinent observations”⁹² and that:

the leadership of our universities [...] is still lagging way behind what we would expect of a set of organisations and institutions that want to promote opportunity not only for women and others who are under-represented but those whose very existence depends on excellence.⁹³

51. When asked about the uncertainty offered by post-doctoral positions which tend to coincide with a time when some people may be considering starting a family, Greg Clark stated that:

it stands there for universities to reflect on. In other walks of life, employers have adjusted their practices in order to be able to accommodate people of talent who otherwise would not be able to work there, and that applies to universities and research institutions.⁹⁴

52. Greg Clark explained that he had set up a “steering group for diversity in appointments across the science and university sector”⁹⁵ and that, although government has “influence”, it is for universities “to take it further themselves. It is in their interests to improve it, and I hope and expect that they will”.⁹⁶

⁸⁹ Q233

⁹⁰ Science and Technology Committee, Sixth Report of Session 2013-14, [Women in scientific careers](#), HC 701

⁹¹ Q248

⁹² Q248

⁹³ Q248

⁹⁴ Q251

⁹⁵ Q249

⁹⁶ Q253

Catapult centres

53. When we pointed out to Greg Clark that all of the chief executives and chairmen of the Catapult centres are currently men, he agreed “very strongly” with our observation that the Government did not appear to be practising what it preached. Greg Clark told us that, although he does not control appointments to Catapult centres, he had “been very clear that [he] will not accept being presented with lists that consist entirely of men” for appointments to the board of Innovate UK, that he had held an event in the Cabinet Office to encourage “more people from diverse backgrounds to apply for these posts” and that the Government needed to “positively [...] go out and talent spot”.⁹⁷

54. There is still a long way to go until women and minority groups are adequately represented in higher education institutions and on the management boards of Catapult centres. We were encouraged by the Minister’s strong statements on this matter and the Government should set out, in its response to this Report, what action it is taking to address this issue, what progress is being made and how it will monitor progress going forward. We note that none of the six preferred candidates chosen during this Parliament for us to consider at pre-appointment have been women. In the interests of transparency, we recommend that each Government Department publish suitably aggregated equality data on candidates shortlisted for appointment to posts subject to pre-appointment hearings by Parliament.

Space sector

55. The space sector is a success story for the UK, and our report on the UK and European space agencies⁹⁸ made recommendations on how to increase that success. Greg Clark told us that the public sector is “more intelligent than in the past”⁹⁹ in respect of the opportunities that space technology offers and that “it is very much on the cross-Government agenda”.¹⁰⁰ The Government has set up the Space for Smarter Government Programme to increase the public sector use of space technology. **The Government’s Space for Smarter Government Programme is a welcome initiative and we encourage the next Government to harness the opportunities that space technology offers the public sector.**

56. During our inquiry, we heard of the value of having a UK national at director-level in the European Space Agency. **We are comforted by Greg Clark’s view that the UK having a director-level representative at the European Space Agency (ESA) has been understood and well taken by the leadership of ESA. We hope that this will result in an actual UK appointment at the upcoming reshuffle of the ESA’s management.**

Astronomy and particle physics

57. Our report on astronomy and particle physics¹⁰¹ highlighted the dramatic cuts in capital budgets that these areas of science were subject to between 2010 and 2015.

⁹⁷ Q247

⁹⁸ Science and Technology Committee, Fourth Report of Session 2013-14, [Work of the European and UK space agencies](#), HC 253

⁹⁹ Q257

¹⁰⁰ Q256

¹⁰¹ Science and Technology Committee, Fourth Report of Session 2010-12, [Astronomy and particle physics](#), HC 806

Greg Clark told us that he agreed with us that these are “area[s] of UK excellence”¹⁰² and that the Government wanted to “continue that position of eminence in this field”.¹⁰³

58. While we welcome the Government’s investment in the Square Kilometre Array, the Science & Technology Facilities Council’s withdrawal from a number of northern hemisphere research-grade telescopes remains of great concern. We note that the drop in astronomy and particle physics funding following the 2007 reorganisation of the Particle Physics and Astronomy Research Council has been perpetuated. We ask that the Government re-examine the funding decisions made in these areas of science. Our successor Committee should be informed as to any change in policy in this regard.

¹⁰² Q263

¹⁰³ Q263

Department for Education

Chief Scientific Adviser and the use of evidence

59. In January 2013, in our report on educating tomorrow's engineers,¹⁰⁴ we expressed grave concerns over the Department for Education's use of evidence in policymaking and the planning of research spending by the department's then Chief Scientific Adviser (CSA). In 2014 the department appointed a new chief analyst who, in his own words, "ticked the box"¹⁰⁵ of also wanting to be departmental CSA. He dedicates approximately one day a week to his CSA duties.¹⁰⁶ Following the explanation we received from the department's Permanent Secretary and the Government Chief Scientific Adviser regarding his appointment,¹⁰⁷ we wrote to the Right Honourable Francis Maude MP, Minister for the Cabinet Office and Paymaster General, Cabinet Office.¹⁰⁸ In his response to our letter, the Right Honourable Oliver Letwin MP, Minister for Government Policy and Chancellor of the Duchy of Lancaster, Cabinet Office, told us that he "recognises the important contribution" that many CSAs have made and that he would "write to each of the departments that you have highlighted in your letter to seek clarification on their intentions in regard to this important post".¹⁰⁹ Oliver Letwin also told us that he proposed working "with the Government's Chief Scientific Advisor [...] and the Government Office for Science to clarify the guidance around government departments appointing Chief Scientific Advisors".¹¹⁰ **We welcome Oliver Letwin's response and request that the Government update us on the action it is taking on this matter and its outcomes.**

60. Our experience with the Department for Education in respect of reforms of A-Level practical science examination reforms (see below) did not give us any confidence that the department heeded our advice in early 2013 that "greater focus needs to be placed on evidence before future changes are made, and [the department] needs to leave sufficient time for evidence to be gathered on the effectiveness of its proposed changes before introducing further change".¹¹¹ This is despite the department's apparent acknowledgement¹¹² that it needed to improve its policymaking practices. Nick Gibb MP, Minister of State for School Reform, told us that the department's new CSA "is determined

¹⁰⁴ Science and Technology Committee, Seventh Report of Session 2012-13, [Educating tomorrow's engineers: the impact of Government reforms on 14-19 education](#), HC 665, paras 88-98

¹⁰⁵ [Oral evidence](#) taken on 10 November 2014, HC (2014-15) 640, Q4 [Dr Leunig]

¹⁰⁶ [Oral evidence](#) taken on 10 November 2014, HC (2014-15) 640, Q15-16 [Dr Leunig]

¹⁰⁷ [Letter to](#) the Chair of the Science and Technology Committee from the Permanent Secretary, Department for Education and the Government Chief Scientific Adviser, Government Office for Science, 16 December 2014

¹⁰⁸ [Letter to](#) the Minister for the Cabinet Office from the Chair of the Science and Technology Committee, 13 January 2015

¹⁰⁹ [Letter to](#) the Chair of the Science and Technology Committee from Rt Hon Oliver Letwin MP, Minister for Government Policy, Cabinet Office, 2 February 2014

¹¹⁰ [Letter to](#) the Chair of the Science and Technology Committee from Rt Hon Oliver Letwin MP, Minister for Government Policy, Cabinet Office, 2 February 2014

¹¹¹ Science and Technology Committee, Seventh Report of Session 2012-13, [Educating tomorrow's engineers: the impact of Government reforms on 14-19 education](#), HC 665, para 95

¹¹² Science and Technology Committee, First Special Report of Session 2013-14, [Educating tomorrow's engineers: the impact of Government reforms on 14-19 education: Government response to the Committee's Seventh Report of Session 2012-13](#), HC 102, paras 58-59

to make sure that in the Department we use rigorous evidence in making policy decisions”¹¹³. **We hope that Nick Gibb’s assertion that the department’s new CSA will ensure that the department uses rigorous evidence in policymaking proves true and that the CSA is able to achieve this in just one day a week.**

61. Following up on our previous recommendation regarding the department’s research budget, Nick Gibb told us that:

The peak was in 2008-09, when we were spending £31.1 million [...] Since 2011-12, research expenditure has been stable at about £11.6 million a year, and last year we saw a slight increase of about £1.2 million. It is still substantial, but it is less than it was in 2008-09.¹¹⁴

62. We accept that the public finances have faced cuts under this Government, however a 63% cut in the department’s research spending between 2008-09 and 2011-12, and a 59% cut in 2013-14 against the 2008-09 baseline, is drastic by any measure. What is more, the department has pushed through radical reforms to the education system under this Government: although the Government recognises the importance of research in the context of education in its Science and Innovation Strategy, we conclude that evidence is still not as central to the department’s policymaking as it should be.

63. The Department for Education has, throughout this Parliament, professed to be pursuing a policy of “exhortation and facilitation”, without ever clearly and simply explaining what the phrase actually means in practice. Nick Gibb told us, however, that “exhortation is working”¹¹⁵, that “all we can do from the centre is exhortation”¹¹⁶ and that schools “are exhorting us about the importance of practicals”.¹¹⁷ **Despite the apparent popularity of “exhortation” at the Department for Education, at the expense, it appears, of Government “facilitation”, and despite our numerous interactions with the department during this Parliament, we are none the wiser as to what “exhortation and facilitation” means in practice and what benefits result from it. Furthermore, we are not convinced that Ministers are unable to pursue their policy aims by means other than “exhortation and facilitation”. We recommend that Ministers exercise their authority to ensure that the policies they support are delivered by the relevant agencies.**

Practical science

64. We have taken a keen interest in the delivery and assessment of practical science in schools,¹¹⁸ most recently in relation to the Office of Qualifications and Examinations Regulation’s (Ofqual’s) proposed reforms of A-Level practical science exams. Amongst other changes, Ofqual recommended that the practical science element of the A-Level examination be graded separately by a ‘pass/fail’ grade. In December 2014 we published a

¹¹³ Q73

¹¹⁴ Q76

¹¹⁵ Q37

¹¹⁶ Q51

¹¹⁷ Q57

¹¹⁸ Science and Technology Committee, Ninth Report of Session 2010–12, [Practical experiments in school science lessons and science field trips](#), HC 1060-I

‘video letter’ to Nick Gibb¹¹⁹ following a roundtable event with a variety of stakeholders. We received evidence from a variety of stakeholders in the science education community on a number of recurring concerns, including:

- Ofqual’s reforms will devalue practical science;¹²⁰
- the reforms will fail to discriminate between pupils’ practical skills;¹²¹
- the proposed reforms were being rushed;¹²² and
- Ofqual had not properly engaged with the science education community.¹²³

65. Nick Gibb told us that Ofqual’s position was that the previous method of assessing practical science “did not discriminate properly”¹²⁴ and suggested that a ‘pass/fail’ grade would achieve that discrimination whilst hoping “that all young people will pass their practicals if that is the approach taken, whether it is at GCSE or at A-Level”.¹²⁵

66. When we referred to our previous engagement with experts in science education on this topic, Nick Gibb explained that “they are not necessarily experts in what motivates schools and they are not necessarily experts in assessment”¹²⁶. **This view of the science education community reflects a flawed approach to engaging with science education experts throughout the reforms process. We continue to be highly concerned about how evidence is collated and used to inform policy in the Department for Education.**

67. Nick Gibb agreed to “go away and look at it again and re-challenge Ofqual on those issues both for A-Level and, more importantly now, for GCSE”.¹²⁷ In follow-up evidence to us in December 2014, Nick Gibb stated that he had been “assured that the arrangements proposed by Ofqual will mean that students can undertake considerably more practical science as part of their A-Level studies than they do currently and that the problem of differentiating between students has been addressed”.¹²⁸ Nick Gibb told us that the reforms “will result in young people leaving school with better skills than they would have had if we had retained the assessed practical skills in the previous A-Levels”¹²⁹ and that Ofqual is currently “considering the responses to those consultations [reforms of GCSE science practical examinations], and also their own position as a result of the research and evidence

¹¹⁹ [‘A message from Andrew Miller MP, Chair of Science and Technology Select Committee, to Nick Gibb MP, Minister for School Reform. Filmed at the Science Museum, London’](#), 26 November 2014

¹²⁰ SCORE (LEG 006) p2

¹²¹ SCORE (LEG 006) p3

¹²² The Royal Society (LEG 001) para 14, Field Studies Council (LEG 005) para 9

¹²³ The Royal Society (LEG 001) para 14, SCORE (LEG 006) p2

¹²⁴ Q40

¹²⁵ Q44

¹²⁶ Q49

¹²⁷ Q89

¹²⁸ [Letter to](#) the Chair of the Science and Technology Committee from the Minister of State for School Reform, Department for Education, 18 December 2014

¹²⁹ Q42

on the A-Level. We are waiting to hear from Ofqual what they have decided for the GCSE, so that question is still open”.¹³⁰

68. Less than two months after Nick Gibb’s evidence to us, the Right Honourable Nicky Morgan MP, Secretary of State for Education, stated in a speech on 27 January 2015 that she was “concerned that a decision to remove practical assessment from science qualifications is in danger of holding back the next generation of scientists” and that she feared that “such a move could inadvertently downgrade the importance of these practical skills”.¹³¹ On 2 March, the Secretary of State published a formal letter to the Chief Regulator of Ofqual, Glenys Stacey, indicating her continuing concern and indicating that the changes should be closely monitored and decisions revisited “if the evidence shows the approach to have had a detrimental effect”.

69. *The Government and Ofqual should update our successor Committee on developments in this area.*

School science facilities

70. Nick Gibb told us that all schools should have fit-for-purpose science facilities and that he believed “very strongly that [...] all secondary schools should have very good quality science laboratories”.¹³² Furthermore, Nick Gibb considered laboratory technicians to be “very important. I do not know how any secondary school would be able to function and provide good quality teaching in the three sciences if they did not have well-motivated and skilled technicians ensuring that the laboratories are properly equipped”.¹³³

71. Notwithstanding the Minister’s assurances, research by the Scientific Community Representing Education (SCORE) found that, amongst other things, “many primary schools lack sufficient appropriate resources to teach practical science effectively; facilities in many primary schools are not adequate for practical science”¹³⁴ and that, in secondary schools,

many state-funded secondary schools and sixth form colleges lack sufficient equipment for basic practical work; inadequate facilities are limiting the practical work that can take place in schools and sixth form colleges; good technician support is being lost because of poor working conditions.¹³⁵

Written evidence from SCORE¹³⁶ and the Royal Society supports this assessment, the latter telling us that “it is clear that the changes needed to improve student’s access to high quality practical work will take time. However initial progress is not reassuring”.¹³⁷

72. According to Nick Gibb:

¹³⁰ Q43

¹³¹ Department for Education, Speech: [Nicky Morgan: why knowledge matters](#) (27 January 2015), Practical Skills

¹³² Q50

¹³³ Q55

¹³⁴ SCORE, [Resourcing Practical Science in Primary Schools](#), April 2013, p2

¹³⁵ SCORE, [Resourcing Practical Science at Secondary Level](#), April 2013, p3

¹³⁶ SCORE (LEG 006) p3

¹³⁷ The Royal Society (LEG 001) para 13

All we can do from the centre is exhortation, but we also provide the capital for schools to improve the fabric of their buildings and facilities, and a considerable amount of money has been allocated for that over the last four years, despite all the public financial constraints in the public sector.¹³⁸

73. Regarding laboratory technicians, Nick Gibb added “again, this is not a terribly satisfactory answer from your point of view. Technicians’ pay is a matter for the school”¹³⁹.

74. The Government’s approach to science facilities in schools is wholly unsatisfactory. Whether it be practical science examinations, science field work and field trips, laboratory apparatus, technicians or school buildings, there is a chronic failure by the Government to create an effective environment for practical science in schools. We strongly recommend that this is pursued during the next Parliament.

Teaching schools

75. The Government told us in November 2011 that “the network of Teaching Schools, many of which will lead on science, is about enabling the best schools to support other schools around them”¹⁴⁰ and that, because “Teaching Schools are a recent innovation”,¹⁴¹ he could not offer any explanation of how they are, or might be, used to improve the skills and knowledge of science teachers. Nick Gibb did, however, tell us that “there is a higher proportion of 2.1s and first-class degrees coming into teacher training now”¹⁴² and the Government “will be training 17,500 maths and science teachers over the next five years [which] is a reflection of the priority we attach to this objective”.¹⁴³ **Although the Government promised to upskill the country’s science teachers, evidence from the Royal Society, Field Studies Council and SCORE suggests there is still significant work to do.**

Careers advice

76. For our report on educating tomorrow’s engineers, we received evidence from The Royal Academy of Engineering that around 820,000 science, engineering and technology (SET) professionals will be required by 2020, with 80 per cent of these required in engineering.¹⁴⁴ In our report we made a number of recommendations regarding the provision of careers advice¹⁴⁵ so that more children pursue engineering careers. Nick Gibb explained that “we have to get it across that engineering is a lucrative, interesting and

¹³⁸ Q51

¹³⁹ Q54

¹⁴⁰ Science and Technology Committee, Eleventh Special Report of Session 2010–12, [Practical experiments in school science lessons and science field trips: Government and Ofqual responses to the Committee’s Ninth Report of Session 2010-12](#), HC 1655, p5

¹⁴¹ Q39

¹⁴² Q39

¹⁴³ [Letter to](#) the Chair of the Science and Technology Committee from the Minister of State for School Reform, Department for Education, 18 December 2014

¹⁴⁴ Science and Technology Committee, Seventh Report of Session 2012-13, [Educating tomorrow’s engineers: the impact of Government reforms on 14-19 education](#), HC 665, para 9

¹⁴⁵ Science and Technology Committee, Seventh Report of Session 2012-13, [Educating tomorrow’s engineers: the impact of Government reforms on 14-19 education](#), HC 665, paras 77-78

demanding world, and we want to encourage more young people, particularly girls, to go into it” and that this country’s shortage of engineers is a “messaging issue”.¹⁴⁶

77. The Government placed schools under a duty to secure access to independent and impartial careers guidance for their pupils from September 2012. In September 2013, Ofsted published a report¹⁴⁷ showing that the new statutory duty was not being implemented well enough and that only one in five schools were effective in ensuring that all its students in years 9, 10 and 11 were receiving the level of information, advice and guidance they needed to support decision-making. Nick Gibb explained that “the Secretary of State [for Education] wants to do more” to ensure that careers advice “is of proper quality and that it is available”¹⁴⁸, adding that “there is more to do, and that is something the Secretary of State [for Education] understands”.¹⁴⁹

78. We agree with the Government that there is much work to be done to ensure that young people receive high quality careers advice that will enthuse them to pursue a career in engineering. Unlike the Minister, we consider this country’s shortage of engineers to be more than just a “messaging issue”.

Schools and research councils

79. Our report on astronomy and particle physics¹⁵⁰ highlighted the value that could be gained from the Department for Education and Research Councils UK fostering relationships between research councils, local education authorities and schools undertaking outreach activities on a more systematic and coordinated basis in primary and secondary education. We also highlighted the importance of the National Schools’ Observatory to science education, and our concern that it was falling between two stools of government departmental responsibility.¹⁵¹

80. Nick Gibb explained that “there is a working party called the space education and skills working group that brings in those elements both in DFE [Department for Education] and BIS [Department for Business, Innovation & Skills] to ensure that precisely what you are worried about does not happen”.¹⁵²

81. The Minister did not give us confidence that research councils carry out outreach activities in schools to inspire children to study the sciences. He did, however, agree that the National Schools’ Observatory carries out valuable work in enthusing children about science: we recommend that our successor committee ensure that it is sufficiently funded to continue doing so.

¹⁴⁶ Q62

¹⁴⁷ Ofsted, [Going in the right direction?](#), September 2013

¹⁴⁸ Q62

¹⁴⁹ Q63

¹⁵⁰ Science and Technology Committee, Fourth Report of Session 2010-12, [Astronomy and particle physics](#), HC 806

¹⁵¹ Science and Technology Committee, Fourth Report of Session 2010-12, [Astronomy and particle physics](#), HC 806, paras 119-121

¹⁵² Q84

Department for Environment, Food & Rural Affairs

Marine science

82. During our inquiry into marine science,¹⁵³ we received evidence that the Government lacked an implementation plan to deliver the potential benefits offered by its marine science strategy.¹⁵⁴ We recommended that it produce an implementation plan, to include a timetable articulating expected outcomes over the next ten years, and update it annually. When we asked George Eustice MP, Parliamentary Under Secretary of State for Farming, Food and Marine Environment, Department for Environment, Food & Rural Affairs, whether a formal implementation plan now existed, he told us that “working groups [of the Marine Science Co-ordination Committee] have been looking at the implementation of strategy in recent months. We expect them to come forward with an agreed plan in about March 2015”.¹⁵⁵ **Five years after publication of its marine science strategy, and nearly two years after we made recommendations on this issue, we are dismayed that the Government is yet to have a formal implementation plan for its marine science strategy.**

Marine conservation zones

83. In 2011, the Joint Nature Conservation Committee and Natural England put forward 127 sites for designation as marine conservation zone (MCZs). In 2013, the Government designated 27 of those sites as MCZs and, in January 2015, commenced a consultation on a further 23 sites proposed for designation. The Government plans to designate a third and final ‘tranche’ of MCZs in 2016. In our report on marine science, we criticised the Government for apparently “moving the goalposts” relating to what level of evidence was required to designate an area as a MCZ.¹⁵⁶ Following his oral evidence to us in October 2014, the Right Honourable Greg Clark MP, Minister of State for Universities, Science and Cities, Department for Business, Innovation & Skills and Cabinet Office, consulted with George Eustice and wrote to us explaining that “for [a MCZ] to be proposed, and subsequently designated, there needs to be reasonable certainty that the feature (habitat or species) of interest is present on the site and of its extent”.¹⁵⁷

84. In oral evidence, George Eustice explained that “in the last four years we have spent around £12 million on surveys of the seabed to check what features are there and to verify that some of those [MCZ] proposals [...] were checked and verified [...] to help get the evidence that we need for the sites that we intend to consult on”.¹⁵⁸ George Eustice added

¹⁵³ Science and Technology Committee, Ninth Report of Session 2012-13, [Marine science](#), HC 727

¹⁵⁴ HM Government, [UK marine science strategy 2010-2025](#), January 2010

¹⁵⁵ Q92

¹⁵⁶ Science and Technology Committee, Ninth Report of Session 2012-13, [Marine science](#), HC 727, para 23

¹⁵⁷ [Letter to](#) the Chair of the Science and Technology Committee from the Minister for Universities, Science and Cities, Department for Business, Innovation & Skills and Cabinet Office, 24 November 2014

¹⁵⁸ Q99

that the Government also carries “out an impact assessment on all of the sites that we seek to designate, and that looks at some of the economic costs of designation”.¹⁵⁹

85. While we would normally applaud the efforts made by the Government to compile a better evidence base for marine conservation zones (MCZs), in this case the Government has muddied the water. Does designation of an area as a MCZ require the ‘best available evidence’, ‘robust evidence’ or evidence that provides ‘reasonable certainty’? In conservation terms, the delay caused by evidence collections means a greater risk that the marine feature will become more degraded: MCZs should be designated ahead of any ‘further analysis’, as was intended by the original legislation. As part of developing a coherent network of marine protected areas there may also be value in protecting areas where significant features no longer exist but have done previously.

86. We have previously expressed concern at the lack of explanation and planning of how MCZs, once designated, would be managed and the uncertainty this created for interested stakeholders and local communities.¹⁶⁰ George Eustice explained that:

We have learned the lesson even earlier than I thought. So we are proposing, when we go to the formal consultation on the second tranche, to give an outline of the type of management measures that we think might be necessary. It is very good to see that the Department has picked that up. It was one of the lessons I learned, after we had a few meetings on this, that we needed to provide that scope, so we will have an element of that in both the second and third tranche.¹⁶¹

87. Marine conservation zones are a prime example of why the Government needed an implementation plan for its marine science strategy. Although its approach does seem to be slowly improving, the Government continues to muddle through the marine conservation zone process and needs to make a greater effort to involve all stakeholders from the early stages of the designation process.

88. The process of designating marine conservation zones has endured significant delays. The department went to consultation on the second tranche of MCZs at the end of January 2015; it is hugely optimistic for the Government to think that it will complete designation of their third, and final, tranche in 2016.

Strategic research

89. The MCZ designation process exposed the lack of data that the UK holds on the marine environment and we have expressed our concerns that long-term strategic data collection is threatened by budget cuts and more high profile marine research.¹⁶² Although research bodies make efforts to “share their data [and] prioritise the observations that they really think are important”¹⁶³ there remains a risk that the value of long-term, low profile

¹⁵⁹ Q100

¹⁶⁰ Science and Technology Committee, Ninth Report of Session 2012-13, [Marine science](#), HC 727, paras 27-28

¹⁶¹ Q106

¹⁶² Science and Technology Committee, Ninth Report of Session 2012-13, [Marine science](#), HC 727, paras 13-16 and paras 41-43

¹⁶³ Q109

data collection can be too easily overlooked. George Eustice told us that “some [oceanography science] is looking at much longer-term impacts of climate change. So they need some security of funding in the long term”.¹⁶⁴ **We agree with the Minister that long-term research and data collection requires security of funding in the long term.**

90. In its response to our April 2013 report, the Government explained that it was commissioning “a thematic review of scientific observations needed to meet the UK’s requirements for environmental data to inform and support research, operational needs, and policy-making”.¹⁶⁵ We were told that “the National Oceanography Centre is part of the team that oversees the project” and that the review is “due to be published in another month or two”.¹⁶⁶ In our evidence session with Professor Sir Mark Walport, Government Chief Scientific Adviser, he agreed¹⁶⁷ on the importance of long-term data collection and “of collections of organisations like Kew”.¹⁶⁸ **We welcome the Government Chief Scientific Adviser’s recognition of the importance of long-term data collection and the National Oceanography Centre’s involvement in the Government’s thematic review, although we remain disappointed by the time it has taken to conduct the review. We recommend that the Government conclude and publish its thematic review urgently.**

91. One way of improving the evidence base on marine life, at negligible public cost, is to work with the marine industries to utilise the enormous amounts of data that they have already collected, and we recommended that such data sharing should form part of licensing conditions for the marine industry.¹⁶⁹ Terence Illott, Deputy Director, Marine Environment Strategy, Department for Environment, Food & Rural Affairs, told us that “the Marine Management Organisation has been working with several industries” and that a monitoring and industry sub-group of the Marine Science Co-ordination Committee (MSCC) “are now commissioning a cross-cutting study on learning from that and what more could be done [...] so it is gradually moving forward”.¹⁷⁰

92. When we asked George Eustice whether the Government had the right balance in having only one representative of the marine industries on the MSCC, in contrast to approximately 25 representatives of public sector organisations,¹⁷¹ he felt that the under-representation of industry was “rectified”¹⁷² by including one industry representative on the MSSC.

93. We are disappointed that more progress has not been made since our report and that the use of industry data is only “gradually moving forward”. We remind the Government of the lack of data it holds on the marine environment, highlighted only

¹⁶⁴ Q113

¹⁶⁵ Science and Technology Committee, Second Special Report of Session 2013–14, [Marine science: Government response to the Committee’s Ninth Report of Session 2012-13](#), HC 443, p9

¹⁶⁶ Q110 [Mr Illott]

¹⁶⁷ Q316

¹⁶⁸ Q316

¹⁶⁹ Science and Technology Committee, Ninth Report of Session 2012-13, [Marine science](#), HC 727, p24

¹⁷⁰ Q96

¹⁷¹ [Marine Science Co-ordination Committee](#), accessed 24 January 2015

¹⁷² Q95 [George Eustice]

too well by its designation process for marine conservation zones, and urge it to step up its collaboration with industry in this area.

94. **In contrast to the Government, we do not think that having only one representative of industry sitting on the Marine Science Co-ordination Committee is sufficient. More direct engagement with the marine industry may encourage more rapid progress in data sharing.**

Antimicrobial resistance

95. In our report, *Ensuring access to working antimicrobials*, we highlighted the information gap that exists relating to the environmental drivers of antimicrobial resistance and the potential for transmission of antimicrobial resistance between animal pathogens and human pathogens.¹⁷³ Paul Green, Operations Director in the Veterinary Medicines Directorate, told us of the “piece of work going on at the moment to look at the most cost-effective way of getting more accurate usage data [...] We have been working closely with the British Poultry Council, the British Pig Executive and others to design the right kind of protocols in terms of the data that would be useful and least burdensome to collect”.¹⁷⁴ Mr Green also explained the UK’s involvement in a European “pilot project, led by the European Medicines Agency, to start the process of designing the protocols in terms of what you can collect in terms of usage, because collecting data can be quite expensive and difficult to do, in order to get it on a consistent and coherent basis”.¹⁷⁵ **Although we acknowledge the importance of ensuring data is collected on a consistent and coherent basis, we note that both initiatives Mr Green refers to are about designing protocols rather than actually collecting data.**

96. George Eustice referred to a group that his fellow DEFRA Minister, Dan Rogerson MP, had “set up to look at the impact of pharmaceuticals on the environment”¹⁷⁶ and told us that “in the veterinary profession [...] there is less evidence of resistance developing”.¹⁷⁷ **We find George Eustice’s assertion particularly troubling. In the absence of an evidence base, taking comfort from “less evidence of resistance developing” in the veterinary profession verges on recklessness.**

97. **We are not convinced that the department has made any real progress since our original report on plugging its antimicrobial resistance evidence gap, nor do we feel that it has a firm grasp on the extent of the work it has to do and the time it will take. This may be an area of interest for our successor committee.**

Water quality

98. In our report on water quality, we made recommendations to increase the information relating to the environmental impact of pharmaceuticals on the aquatic environment and innovation in the water industry, whilst touching on the issue of water security.¹⁷⁸

¹⁷³ Science and Technology Committee, First Report of Session 2014–15, [Ensuring access to working antimicrobials](#), HC 509 paras 41-56

¹⁷⁴ Q126 [Mr Green]

¹⁷⁵ Q126 [Mr Green]

¹⁷⁶ Q120

¹⁷⁷ Q124 [George Eustice]

¹⁷⁸ Science and Technology Committee, First Report of Session 2013–14, [Water quality: priority substances](#), HC 272-I, paras 30-31

George Eustice told us that “there is an evidence gap here. There is more work to be done”,¹⁷⁹ and, in a written update to us, Dan Rogerson told us that “the evidence base needed improving in a number of areas, including ecotoxicological data; quality of research; and access to data (e.g. those owned by pharmaceutical companies)”.¹⁸⁰ ***We recommend the Government fill the evidence gap that has been identified and, early in the new Parliament, report to our successor Committee on how it has acted on the findings set out in the Minister’s update to us.***

99. During our inquiry, the then Government Chief Scientific Adviser sought to highlight the importance of water security in the “perfect storm” of food security, energy security and climate change.¹⁸¹ George Eustice recognised that “water in many parts of the world is going to become the first constraining and limiting resource on food production”.¹⁸² ***Innovation in the water industry and its effect on water security may be an area of interest for our successor committee.***

¹⁷⁹ Q130 [George Eustice]

¹⁸⁰ [Letter to](#) the Chair of the Science and Technology Committee from Dan Rogerson MP, Parliamentary Under Secretary of State for Water, Forestry, Rural Affairs and Resource Management, Department for Environment, Food & Rural Affairs, 24 September 2014, p2

¹⁸¹ Science and Technology Committee, First Report of Session 2013–14, [Water quality: priority substances](#), HC 272-I, para 30

¹⁸² Q139

Department of Health

Scientific advice structures

100. Government departments often establish scientific advisory committees (SACs) that provide independent scientific advice on defined policy areas. SACs are expected to conduct themselves according to the Code of Practice for Scientific Advisory Committees.¹⁸³ The Code states that “for departments who are significant users of science and/or have a large number of expert scientific committees or other science advisory bodies”, it is “good practice to have an overarching departmental Science Advisory Council with oversight of all such scientific advice bodies”.¹⁸⁴ The Department of Health has the largest number of scientific advisory bodies of any government department but does not have a departmental scientific advisory council.

101. In oral evidence, George Freeman MP, Parliamentary Under Secretary of State for Life Sciences, explained that “possibly the reason why there is not one central science council is that there is already such an extensive range of existing organisations”.¹⁸⁵ Jane Ellison MP, Parliamentary Under Secretary of State for Public Health, explained that “the main reason” why a science advisory council had not been constituted “is partly a desire to remain flexible to whatever is the particular area of scientific challenge [...] it would be very unlikely that you could form a committee that encompassed every discipline and expertise in every area”.¹⁸⁶ **We were surprised that neither Minister appeared to appreciate the role of a science advisory council. It is precisely because the Department of Health has so many science advisory bodies that, under the Code of Practice for Scientific Advisory Committees, it would be good practice for it to have a science advisory council co-ordinating the work of the department’s science advisory bodies and their advice to the Government.**

102. The role of a departmental Chief Scientific Adviser (CSA) is to ensure that departmental decisions are informed by the best science and engineering advice. An important part of the CSA role is to provide independent advice and challenge to the government’s decision making process. The Department of Health is the only department to also have a Chief Medical Officer (CMO). The CMO acts as the government’s principal medical adviser and, as such, is not intended to exercise the same independence or scrutiny of Government. In the Department of Health, the role of CSA and CMO is filled by the same person.

103. George Freeman explained “from [my] point of view in terms of research, I think it is a strength that the two functions of the chief medical officer and chief scientific officer within the Department are unified. There is huge strength from that”.¹⁸⁷ The Minister continued: “the chief medical officer being also the chief scientific officer enables us to put

¹⁸³ Government Office for Science, [Code of Practice for Scientific Advisory Committees](#), November 2011

¹⁸⁴ Government Office for Science, [Code of Practice for Scientific Advisory Committees](#), November 2011, para 10

¹⁸⁵ Q5 [George Freeman]

¹⁸⁶ Q5 [Jane Ellison]

¹⁸⁷ Q2

that [the patient voice and patient benefit] absolutely at the heart of policy”.¹⁸⁸ Jane Ellison agreed with George Freeman that “it was very helpful to have that meeting with the chief medical officer who could speak to the research and the science, in exactly the way George spoke about looking at it from a patient perspective”.¹⁸⁹ Professor Walker, Deputy Chief Medical Officer, informed us that “the current arrangement whereby the CMO is also the chief scientific adviser has not always been the case. It is the case for this CMO but it was not for the previous one”.¹⁹⁰

104. We do not disagree that patient benefit should be at the heart of the healthcare system, but we are concerned that the Ministers do not appreciate the different functions of a CSA and CMO. Filling the posts of CSA and CMO with the same person deprives the government of having two leading scientific voices in the department.

105. We recommend that the department ensures that filling the roles of Chief Medical Officer and Chief Scientific Adviser with the same person does not limit the potential challenge of policy through rigorous scientific advice. We further recommend that the department review its structures for the provision of scientific advice to ensure that they are as effective as possible and reflect good practice.

Technological innovation and research

106. In our report on UK blood safety and the risk of variant Creutzfeldt-Jakob Disease,¹⁹¹ we received evidence that the National Health Service (NHS) could do more to facilitate the trialling and use of innovative technology in the healthcare system. In oral evidence, George Freeman explained that “we have created within the Department [of Health] a new directorate of innovation, technology and growth. The central mission is to further the use of innovation in the delivery of 21st century health care and the embracing of science and innovation”.¹⁹² George Freeman also referred to the Innovative Medicines and MedTech Review launched by the Government in November 2014 which is “a review of our landscape—our system—for assessing innovative medicines and medical technologies”¹⁹³ which “will consider how to speed up access for NHS patients to cost-effective new diagnostics, medicines and devices and ensure that we are well-placed to capitalise on the growing body of technological devices [...] the review will start early in 2015 and its Terms of Reference will be published at this point”.¹⁹⁴ He told us that looking for new systems and approaches “is utterly central to my role”.¹⁹⁵

107. George Freeman explained that the Innovative Medicines and MedTech Review “is looking at how we can better align our landscape for bringing innovative medicines into the health service for patient benefit, and use our profound global advantage through the jewel that is the NHS—an integrated health system with an NIHR platform at the heart of

¹⁸⁸ Q4 [George Freeman]

¹⁸⁹ Q4 [Jane Ellison]

¹⁹⁰ Q6 [Professor Walker]

¹⁹¹ Science and Technology Committee, Second Report of Session 2014–15, [After the storm? UK blood safety and the risk of variant Creutzfeldt-Jakob Disease](#), HC 327 incorporating HC 990, session 2013-14

¹⁹² Q1 [George Freeman]

¹⁹³ Q9

¹⁹⁴ Department of Health (LEG 010)

¹⁹⁵ Q17

it”. The review seeks to “move away from what I call a 20th century model of development” so that medical research and technology moves into “the new landscape” which:

allow[s] us to do heavily supervised research medicine with volunteer patients and research clinicians through the NIHR, to put innovations into patient groups — small cohorts of highly monitored and supervised patient studies — and use those insights to work out with NICE and MHRA what the appropriate roll-out would be into wider cohorts. It is a different model of research. We are genuinely hoping that industry, big and small, and charities and patient groups will come to the table with us.¹⁹⁶

108. As our work during this Parliament has highlighted,¹⁹⁷ the role of the NHS in developing and utilising innovative technology is hugely important and Jane Ellison highlighted that its:

recent “Five Year Forward View” [...] put innovation and bringing quickly into use things that can be of benefit, particularly things that can both benefit patient safety and save the NHS money, right at the heart of that forward view for the NHS. There is significant recognition that, where innovation can drive both of those twin goals, the NHS needs to do more, but the fact that they have put it as a central part of their vision for our future NHS is encouraging and important. It is right at the heart of that strategy.¹⁹⁸

109. Despite this, and in contrast to some government departments, we have seen no evidence of the Department of Health’s or the NHS’ use of Government procurement schemes, such as the Small Business Research Initiative, to procure cutting-edge technology from innovative businesses.

110. Although we are not as convinced as the Minister that innovation is “right at the heart” of the NHS’ forward view, we are comforted that the Government recognises the opportunity offered by innovative technology in our healthcare system and now appears to be taking proactive steps to exploit that opportunity. We recommend that the Government update our successor committee on the progress of the Innovative Medicines and MedTech Review, the work of the Department of Health’s new directorate of innovation, technology and growth and the department’s involvement in the Small Business Research Initiative within six months of this Report and explain how it intends to implement the recommendations of that review.

111. Our report on UK blood safety and the risk of variant Creutzfeldt-Jakob Disease¹⁹⁹ also highlighted concerns with the allocation of research funding by the Department of Health. George Freeman explained that “the CMO [Chief Medical Officer] and NIHR

¹⁹⁶ Q20

¹⁹⁷ Science and Technology Committee, Eighth Report of Session 2012-13, [Bridging the valley of death: improving the commercialisation of research](#), HC 348, p47-49

¹⁹⁸ Q18 [Jane Ellison]

¹⁹⁹ Science and Technology Committee, Second Report of Session 2014-15, [After the storm? UK blood safety and the risk of variant Creutzfeldt-Jakob Disease](#), HC 327 incorporating HC 990, session 2013-14

[National Institute for Health Research] process [...] contains within it a series of mechanisms to make sure we are spending that research budget within the Department on appropriate priorities”²⁰⁰ and mentioned the immediate, medium-term and long-term priorities the department has to consider. Jane Ellison referred to the department’s desire to “retain the flexibility to back the best bids for research funding and the best science”²⁰¹. George Freeman added that “Transparency in the setting of those research priorities is a really interesting question. I myself asked NIHR on a number of points how they determined some of the shorter-term priorities that appear. I think it would be a very helpful line of inquiry for the Committee”.²⁰²

112. When asked why the Department of Health’s appraisal alignment working group, which is responsible for reviewing research appraisals, is led by the department’s chief economist without, as far as the Committee is aware, receiving any input from the CMO or their team, George Freeman “was not aware, and am quite surprised to hear, that there is no input”²⁰³ from the CMO. In subsequent written evidence, George Freeman referred back to a previous explanation given to the Committee that “it is about the methodological approach to evaluation, not about the science itself” and promised to provide the Committee, in early 2015, “following discussion with CMO and CSA [Chief Scientific Adviser]” an “update together with an explanation of if and how the membership of the AAWG [appraisal alignment working group] is to be enhanced. It will directly address the pros and cons of greater scientific and medical expertise on the Working group”.²⁰⁴

113. We have seen no evidence that the Department of Health has effective processes and advisory structures in place to ensure that the allocation of research funding is best aligned with the most valuable science. This is even more relevant given the “new landscape” referred to by the Minister and the Government’s Science and Innovation Strategy. We recommend that the department review how it currently allocates research funding, whether this is fit for future needs, and report to our successor committee on both the findings of this review and the changes to be made as a result.

Antimicrobial resistance

114. Our report, *Ensuring access to working antimicrobials*, highlighted the profound challenges facing the UK and the global community as a result of the growing resistance of microbial populations to current drugs and the need to control infection. While the Committee was drafting its report on antimicrobial resistance in the summer of 2014, the Prime Minister announced an independent review of “the economic issues surrounding antimicrobial resistance”.²⁰⁵

²⁰⁰ Q11 [George Freeman]

²⁰¹ Q11 [Jane Ellison]

²⁰² Q13 [George Freeman]

²⁰³ Q7

²⁰⁴ Department of Health (LEG 009)

²⁰⁵ Science and Technology Committee, First Report of Session 2014–15, [Ensuring access to working antimicrobials](#), HC 509, para 5

115. George Freeman explained that “there are two parts” to antimicrobial resistance that the Department is tackling: making sure that “we prescribe smarter and that we reduce the overuse of antibiotics” and to “accelerate the landscape for the generation of new treatments and tackle some of the problems in that landscape”.²⁰⁶

116. Public Health England reported that the 6% increase in the use of antibiotics in England between 2010 and 2013 “is an under-estimate of total consumption”²⁰⁷ and Jane Ellison recognised that this “is a concerning picture and we have to do better from here”²⁰⁸. The Government now has “a baseline from which to move forward”²⁰⁹ and Jane Ellison noted that “there is quite granular work to do on that”²¹⁰. She told the Committee that “a number of pieces of work are under way to look at prescribing practices. They are very variable”²¹¹. In her follow-up written evidence, Jane Ellison referred, amongst other initiatives, to a “literature review and behavioural analysis exploring the key features that affect prescribing of antibiotics” being undertaken by the Department of Health and Public Health England, and a pilot letter from the Chief Medical Officer to general practitioners regarding “their antimicrobial prescribing rates compared to other local GPs”²¹². In its 2014 annual progress report and implementation plan²¹³ for its Antimicrobial Resistance Strategy 2013–2018 one of the Government’s seven key areas for future action is ‘Optimising prescribing practice’.

117. Based on our previous discussions with the Government on antimicrobial resistance, we are satisfied that the Government appreciates the scale of the challenges ahead. Although we are reassured that the Government recognises the importance of responsible prescribing of antimicrobial drugs, the Government has significant work to do to reverse the recent trend of increased antimicrobial prescribing.

118. George Freeman highlighted that the Office for Life Sciences, for which he has ministerial responsibility, “is now running as a joint BIS and DH organisation partly for this sort of initiative, to make sure we are developing joined-up policy. We set up a working group to pull together the key stakeholders in the antimicrobial field”.²¹⁴ George Freeman explained that “there are some real challenges in this sector. Not only is the science hard but it is a particularly challenging business model”.²¹⁵ However, despite George Freeman “pulling together this group at the Office for Life Sciences to look at whether [...] there is anything we can do to support long-term investment”²¹⁶ and Jane Ellison “pulling together key industry stakeholders and other people to look at what

²⁰⁶ Q19 [George Freeman]

²⁰⁷ Public Health England, [English surveillance programme for antimicrobial utilisation and resistance \(ESPAUR\)](#), September 2014, p9

²⁰⁸ Q23

²⁰⁹ Q23

²¹⁰ Q23

²¹¹ Q23

²¹² Department of Health (LEG 008)

²¹³ HM Government, [UK 5 Year Antimicrobial Resistance \(AMR\) Strategy 2013–2018, Annual progress report and implementation plan, 2014](#), (December 2014)

²¹⁴ Q19 [George Freeman]

²¹⁵ Q19 [George Freeman]

²¹⁶ Q19 [George Freeman]

more can be done in the interim”,²¹⁷ we received evidence from the Association of the British Pharmaceutical Industry (ABPI) that “the level of engagement is not yet adequate or frequent enough to advance concrete work in a meaningful way”.²¹⁸

119. Although Jane Ellison told us that the Government is working to address the challenges of antimicrobial resistance and that “it is not just a case of waiting for the O’Neill review to report”,²¹⁹ evidence from the ABPI stated that it was “awaiting information on how this work [on any pricing alternatives] can be carried out and accelerated” and that it “would welcome opportunities to discuss the industry’s part in delivering this”.²²⁰ The ABPI “look[s] forward to working more closely with the Department of Health to make progress on several fronts, issues particularly in finding more innovative ways of pricing and reimbursement which reward innovation and at the same time support careful prescribing”.²²¹ It explained that if “the Government should work with industry to develop pricing alternatives in the near term, this has the potential to influence investment decisions”.²²²

120. We welcome the Government’s fledgling efforts to develop joined-up policy in this area but they do not yet appear to be translating into meaningful engagement with the pharmaceuticals industry. We recommend that the Office for Life Sciences immediately and directly engages with the pharmaceutical industry to ensure that industry’s interests are effectively incorporated into Government policy on antimicrobial resistance.

121. We remind the Government that the development of new antimicrobial drugs is not sufficient in itself. Responsible husbandry of existing and future drugs is essential to ensure that the UK successfully manages the challenge of antimicrobial resistance. This may almost certainly mean a new pricing policy.

Medical implants

122. In our report, *Regulation of medical implants in the EU and UK*,²²³ we expressed concern at the reliance on “equivalence data” for medical implants, inadequate post-market surveillance and reporting by healthcare professionals and a lack of transparency regarding the safety and performance of implants.

123. Although George Freeman told us that “equivalence data should be the exception rather than the rule when it comes to approving medical implants”,²²⁴ he explained that “the single most important issue to address is to ensure that notified bodies are adequately assessing a manufacturer’s clinical evidence before a device is placed on the market”.²²⁵

²¹⁷ Q19 [Jane Ellison]

²¹⁸ Association of the British Pharmaceutical Industry (LEG 004) para 4.3

²¹⁹ Q19 [Jane Ellison]

²²⁰ Association of the British Pharmaceutical Industry (LEG 004) para 4.1

²²¹ Association of the British Pharmaceutical Industry (LEG 004) para 4.3

²²² Association of the British Pharmaceutical Industry (LEG 004) para 4.6

²²³ Science and Technology Committee, Fifth Report of Session 2012–13, [Regulation of medical implants in the EU and UK](#), HC 104

²²⁴ Department of Health (LEG 011)

²²⁵ Department of Health (LEG 011)

124. During our inquiry, we were told of the evidential value of analysing explanted medical implants. George Freeman explained that “there is active work going on to make sure that we are doing that, and I will happily write to you with the detail of where we have got to”.²²⁶ The Government told us that “it would not be feasible to undertake the routine analysis of explanted joints”²²⁷ and, in its follow-up evidence for this Report, the Government explained that “explanted joints can provide valuable evidence but we consider that this is more appropriately undertaken on a targeted basis”.²²⁸ **Given the lack of explanation of the work that the Government tells us is currently being conducted, we can only assume that very little analysis of explanted medical implants is actually taking place.**

125. The Government explained how the reporting, by healthcare professionals, of incidents with medical implants was improving. These included improved General Medical Council guidance and the appointment of a “board-level director with responsibility for medical device incident reporting” in “every NHS Trust”.²²⁹

126. The Government has made improvements to the regulation of medical implants without addressing one of the key risks associated with them, namely the lack of primary data relating to new and updated devices. This poses a public health risk. Our successor committee may wish to revisit this topic in light of the changing regulatory regime.

²²⁶ Q33 [George Freeman]

²²⁷ Department of Health (LEG 011)

²²⁸ Department of Health (LEG 011)

²²⁹ Department of Health (LEG 011)

Government Office for Science

Science advice in government

127. Professor Sir Mark Walport, Government Chief Scientific Adviser, Government Office for Science (GO-Science), told us that the independence of scientific advice depended “significantly [on] the quality of the individual”.²³⁰ Sir Mark added that “the independent-mindedness of the individual and their ability to speak in an untrammelled fashion”²³¹ are also vital components of independent advice.

128. Sir Mark told us that in respect of the actual structural arrangements for providing scientific advice, “fundamentally, they work quite well”²³², although he continued that:

there are different sorts of scientific advisory councils and there are different types of scientific advisers in Government Departments. The challenge is always to improve the quality and the quantity. Some Departments are more open to it than others. It is a constant drive to raise the game.²³³

129. In respect of departmental Chief Scientific Advisers (CSAs), Sir Mark explained that “there are some Departments where, probably, both you and I would like more scientific input [...] Are there a couple of Departments where there is more to do? Yes.”²³⁴ Despite this, he told us that “while my role is to encourage, ultimately I am not accountable and I can’t force Departments to have a chief scientist, but it is a constant discussion”.²³⁵ However, as Government Chief Scientific Adviser, Sir Mark is directly involved in the appointment of departmental CSAs, a fact borne out recently by the letter we received from Sir Mark and the Department for Education’s Permanent Secretary that stated that “CSA appointments are a matter for the relevant Permanent Secretary and the Government’s Chief Scientific Advisor and so we are replying on the Secretary of State’s behalf”.²³⁶

130. The Government Chief Scientific Adviser is directly involved in the appointment of departmental Chief Scientific Advisers. We strongly recommend that he ensures that those departments without CSAs fill the post as soon as practicable with suitably qualified independent individuals who will dedicate at least three days a week to the role, as recommended by the House of Lords Science and Technology Committee.²³⁷ We further recommend that the Government Chief Scientific Adviser works with government departments to ensure their scientific advisory structures are fit for purpose.

²³⁰ Q275

²³¹ Q275

²³² Q278

²³³ Q278

²³⁴ Q330

²³⁵ Q330

²³⁶ [Letter to](#) the Chair of the Science and Technology Committee from the Permanent Secretary, Department for Education and the Government Chief Scientific Adviser, Government Office for Science, 16 December 2014

²³⁷ House of Lord Science and Technology Committee, Fourth Report of Session 2010-12, [The role and functions of departmental Chief Scientific Advisers](#), HL Paper 264, para 54

Horizon scanning

131. Following our report on government horizon scanning²³⁸, the Government's new Horizon Scanning Programme Team (announced in May 2013) published its first outputs in December 2014.²³⁹ Each publication clearly states on its first page that "THIS ANALYSIS WAS COMPLETED IN 2013 AND HAS NOT BEEN UPDATED WITH MORE RECENT DATA BUT SENSITIVE INFORMATION, SUCH AS POLICY IMPLICATIONS HAVE BEEN REMOVED".²⁴⁰ **Publishing the outputs of the Government's Horizon Scanning Programme Team at least a year after they have been completed is simply not good enough. We recommend the government publish horizon scanning papers within a month of completion.**

132. The topics covered by the Horizon Scanning Programme Team's first published papers include "Big Data" and "Resource Nationalism". We asked Sir Mark whether these are future issues or current ones and he told us that "they are a bit of both"²⁴¹ and that government "need[s] to be imaginative — and you can always be more imaginative".²⁴² He added that "there is also a lot of other futures work that is going on" and referred to work of GO-Science's Foresight Unit which is conducting "a lot of very far-sighted work as well. Horizon scanning has got to be a mixture of scanning short-term horizons and long-term horizons"²⁴³. Sir Mark explained that "the transmission mechanisms within Government for the work are much more effective than they used to be".²⁴⁴ When discussing knowledge and 'intelligence' about pandemic diseases, be they human, animal or plant, he noted that "we need very good horizon scanning on the things we know about".²⁴⁵

133. Sir Mark told us that the Government "is bringing in outsiders"²⁴⁶, conducts "widespread external consultation"²⁴⁷ and that "the bottom line is that we consult widely".²⁴⁸

134. **Putting aside the fact that we prefer the term "futures analysis" to horizon scanning, we are deeply concerned that the Government's Horizon Scanning Programme team is not looking to the future at all and that, by the time its work is published, it may be outdated. Furthermore, its work and operations are not transparent and, although the Government tells us that it is consulting widely as part of its horizon scanning activities, we are disappointed that there is no external representation on the Horizon Scanning Oversight Group. We are also confused as to why the Government's professed 'horizon scanning' takes place separately from the work of the Foresight Unit and see benefits from the two working in a more integrated**

²³⁸ Science and Technology Committee, Ninth Report of Session 2013–14, [Government horizon scanning](#), HC 703

²³⁹ Cabinet Office Analysis and Insight Team, [Horizon Scanning – Publishing our work](#), accessed 30 January 2015

²⁴⁰ HM Government, Horizon Scanning Programme, [Emerging Economies: Demographic Change](#) (December 2014), p1

²⁴¹ Q282

²⁴² Q298

²⁴³ Q282

²⁴⁴ Q282

²⁴⁵ Q310

²⁴⁶ Q282

²⁴⁷ Q290

²⁴⁸ Q284

way. *We recommend that the Foresight Unit and the Horizon Scanning Programme Team form one central source of government horizon scanning. Locating GO-Science in the Cabinet Office would facilitate this.*

Scientific advice and evidence in emergencies

135. In our report on scientific advice and evidence in emergencies,²⁴⁹ we were concerned at the apparent lack of involvement of the Government Chief Scientific Adviser in developing the national risk assessment (NRA). Sir Mark explained that he “has been quite closely involved in meetings and discussions” in the most recent update of the NRA and that “we speak to our colleagues in the United States about what should be included in the risk register [...] there is a good process for looking and seeing”²⁵⁰. He added that a “big review is going on for next year”²⁵¹. Although Ebola, and other haemorrhagic diseases, are included on the Government’s national risk assessment, it has not been explained to us how the Government’s emergency apparatus was triggered for the Ebola outbreak in West Africa and why it took so long. **We are encouraged that Sir Mark has been directly involved in this year’s update of the national risk assessment and that a review of the assessment process is ongoing. We remind the Government of our recommendations regarding the input of scientific advice and evidence into the national risk assessment. We recommend that the Government sets out, in its response to this Report, its process for gathering and assessing the information that is involved in the national risk assessment as well as when and how a risk on the national risk assessment is triggered.**

136. We previously recommended²⁵² the publication of enhanced guidance for the operation of the scientific advisory group in emergencies (SAGE). In 2012 the Government published its Enhanced SAGE Guidance²⁵³ and the Government recognised our input in this area.²⁵⁴ We also recommended that the Government improve its ability to communicate scientific advice and evidence to the public in emergency situations.²⁵⁵ The Enhanced SAGE Guidance includes provisions regarding SAGE communications. Sir Mark told us that “we have specifically had a SAGE rehearsal around communications alone. We have brought in people with expertise [...] the scenario was all about communications. It was not about the science; it was about how we communicated”.²⁵⁶

137. The minutes for the SAGE established for the Ebola outbreak have not yet been published; Sir Mark told us that “the minutes will be published” but, in contrast, explained that, in respect of other papers and outputs of SAGE meetings, “a lot of that material will

²⁴⁹ Science and Technology Committee, Third Report of Session 2010–11, [Scientific advice and evidence in emergencies](#), HC 498

²⁵⁰ Q324

²⁵¹ Q319

²⁵² Science and Technology Committee, First Report of Session 2012–13, [Devil’s bargain? Energy risks and the public](#), HC428, para 48

²⁵³ Cabinet Office, [Enhanced SAGE Guidance: A strategic framework for the Scientific Advisory Group for Emergencies \(SAGE\)](#) (October 2012)

²⁵⁴ Cabinet Office, [Enhanced SAGE Guidance: A strategic framework for the Scientific Advisory Group for Emergencies \(SAGE\)](#) (October 2012), page 23, footnote 18

²⁵⁵ Science and Technology Committee, Third Report of Session 2010–11, [Scientific advice and evidence in emergencies](#), HC 498, para 123

²⁵⁶ Q320

come into the public domain by other routes”.²⁵⁷ The Government’s Enhanced SAGE Guidance states that “the SAGE secretariat should also act as the information manager for all SAGE products, storing and circulating them and publishing them as and when appropriate”.²⁵⁸

138. Since the publication of our report, *Scientific advice and evidence in emergencies*, SAGE has been constituted for the Fukushima nuclear disaster, the 2013-2014 winter floods and the Ebola outbreak. Sir Mark told us that “ultimately it is [his] responsibility”²⁵⁹ to ensure that SAGE complies with the Government Enhanced SAGE Guidance and in follow-up evidence to us, Sir Mark wrote that one of the lessons learned following the 2013-14 winter floods SAGE was “Providing more challenge to the Government process on when and how to provide scientific advice during an incident”.²⁶⁰ Sir Mark also told us that our successor committee could expect recent SAGE operations to be reviewed because “it is the job of any well-functioning committee to review its own function from time to time”.²⁶¹

139. The Government has made progress in how scientific advice is incorporated into the national risk assessment and in SAGE guidance. We do, however, remind the Government of the need for SAGE to be as transparent as possible. We recommend that all of the output of SAGE meetings, minutes and other papers, be published as soon as possible after an emergency situation ends. We also recommend that the Government formally review the effectiveness of recent SAGEs and their compliance with the Government’s Enhanced SAGE Guidance and publish the findings of this review.

Communicating climate science

140. In our report, *Communicating climate science*, we expressed concern that a failure of Government to properly communicate the state of the science could lead to a loss of public support for climate policies.²⁶² Sir Mark was reassured by a recent survey about public attitudes to science; he told us that of the public “78% felt informed and 99%, at least, had heard of”²⁶³ climate change. The Department for Energy and Climate Change (DECC) told us that it is “establishing an expert science communications group to improve the way climate science is communicated by HMG and agencies and organisations such as the Met Office Committee on Climate Change and learned societies. We are currently working out the details of the strategic role that this group will have, and its terms of reference”²⁶⁴ and that it had recently held an all-day ‘tweetathon’ on climate change.²⁶⁵ The Government has

²⁵⁷ Q307

²⁵⁸ Cabinet Office, [Enhanced SAGE Guidance: A strategic framework for the Scientific Advisory Group for Emergencies \(SAGE\)](#) (October 2012), para 50

²⁵⁹ Q300

²⁶⁰ Government Office for Science (LEG 018)

²⁶¹ Q308

²⁶² Science and Technology Committee, Eighth Report of Session 2013–14, [Communicating climate science](#), HC 254

²⁶³ Q331

²⁶⁴ Department for Energy and Climate Change (LEG 014), p2

²⁶⁵ Department for Energy and Climate Change (LEG 014), p2

also informed us of a “cross Whitehall communications capability review”²⁶⁶ that is underway.

141. We do not dispute that the public is aware of climate change; however, our inquiry focused on how climate science is communicated and the content of that communication, which can have a dramatic effect on the public’s understanding and perception of the issue. Although we welcome DECC’s use of social media, we do not feel that climate science can be effectively communicated in 140 characters. Organisations such as the Science Media Centre and media fellowships at the British Science Association may provide opportunities for government collaboration with media professionals.

142. The Committee has also been concerned that in order to communicate climate change effectively the whole of government should use one agreed definition. When this was put to Sir Mark Walport we were surprised at his answer “... if you look at any dictionary definition, you will mostly find three or four related ways of expressing it. There is no single biblical legislative definition, and all of these things need to be framed”.

143. The Government has made little progress in improving its communication of science. Science is neither lexicography nor scripture and for it to be communicated effectively there should be an agreed scientific definition of climate change. We are disappointed that nearly a year after our report on communicating climate science, DECC has not even agreed the terms of reference for its climate change communications group. We urge the next Government to systematically review how it can best communicate science to the public. This may be an area of interest for our successor committee.

144. Sciencewise is “the UK’s national centre for public dialogue in policy making involving science and technology issues”.²⁶⁷ Sir Mark’s view was that “the public funding of science engagement is important and, therefore, the programme that Sciencewise does is important”²⁶⁸ and that “on the broad principle of whether the Government as part of their funding should be funding public engagement work, the answer to that is yes”.²⁶⁹ **We were encouraged that the Government Chief Scientific Adviser recognises the value of funding public engagement. We recommend that the Government protect Sciencewise’s funding and consider using Sciencewise as a channel through which scientific advice and evidence is communicated to the public, even where that evidence and advice is contrary to government policy.**

²⁶⁶ [Letter to](#) the Chair of the Science and Technology Committee from the Minister of State for Universities, Science and Cities, Department for Business, Innovation & Skills and Cabinet Office, and the Government Chief Scientific Adviser, Government Office for Science, 27 January 2015

²⁶⁷ [Sciencewise](#), accessed 30 January 2015

²⁶⁸ Q336

²⁶⁹ Q337

Home Office

Chief Scientific Adviser and the use of evidence

145. During our first inquiry into the Government’s decision to close the Forensic Science Service, we expressed our deep concerns at the CSA’s exclusion from the decision-making process, and his apparent satisfaction at that exclusion.²⁷⁰ We were staggered that the department’s official response to our report still did not recognise the scientific consequences of closing the Forensic Science Service nor that the department’s CSA should have provided science advice from the outset. When we asked Lord Bates, Parliamentary Under Secretary of State for Criminal Information, whether this was a mistake, he stated that “there is a strong scientific element to it” and that “as a matter of routine, of course, that would be something that the chief scientific adviser should be involved in and advising on”.²⁷¹ Alan Pratt, Director of Science, Engineering and Technology in the Home Office, added that “given the strength of feeling of the Committee, had we our time again, perhaps we would have done things slightly differently”.²⁷²

146. The division of the forensics market into a police “in-house” market and a private market has raised concerns that there is a strong chance of losing the contextual analysis of individual forensic evidence provided by a range of different forensic practices. A police officer asking for a single forensic test may not necessarily be aware of the potential of this contextual analysis. Lord Bates told us that:

There is no evidence that that has been a problem. If it were, as you suggest, then that would certainly be something which the forensic science board and the scientific advisers would be expressing a major concern about and demanding action, and rightly so, but they are not saying that.²⁷³

147. Lord Bates added that “we cannot detect that there has been any diminution of the overall forensic science capability in the country. If anything, it has probably been enhanced by plugging it into a broader network internationally”.²⁷⁴ ***The Government should, in its response to this Report, set out the evidence on which the Minister based this statement.***

148. ***Given the department’s previous approach to using scientific advice and evidence, we are concerned that Ministers in the department are still not receiving the level of scientific advice and evidence on this matter that they require. We recommend that the Home Office reviews its governance structures for ensuring scientific advice and evidence is fully integrated into policymaking and ensures that scientific advice and evidence is effectively incorporated into government policy.***

149. ***We request that the Home Office’s Chief Scientific Adviser writes to our successor committee to reassure it that he is aware of the scientific risks posed by the changing***

²⁷⁰ Science and Technology Committee, Seventh Report of Session 2010–12, [The Forensic Science Service](#), HC 855, para 171

²⁷¹ Q144 [Lord Bates]

²⁷² Q145

²⁷³ Q166

²⁷⁴ Q188

forensic science landscape and that he is actively engaged with the policy development in this matter.

Forensics strategy

150. In both our first report in 2011 on the Forensic Science Service²⁷⁵ and our follow-up report on forensic science in 2013, we were clear that the Government needed a forensic science strategy and set out, in the latter report, key areas that the strategy should cover.²⁷⁶ In its response to our 2013 report, the Government told us that it was “drawing up a biometric and forensic strategy to be completed by the end of the year [2013]”.²⁷⁷

151. No biometric and forensic strategy has been produced. Lord Bates was “sorry that we have not been able to meet those commitments” and explained that “what we have just undertaken to do now is to commission some further collection of data to see if we can find a way through what should be focused on” because “if you can’t agree with the territory that you are seeking to come up with a strategy for, then it is very difficult to agree the strategy”.²⁷⁸ In follow-up evidence to our inquiry into current and future uses of biometric data and technologies, Lord Bates anticipated that this further data collection “should be complete within three months”²⁷⁹ and that “that should be the end of it”²⁸⁰ and that “the strategy itself [would] follow”.²⁸¹

152. Research and development was one of the keys areas that we recommended should be covered by the Government’s strategy.²⁸² The Government needs to ensure that forensic science providers are able to capitalise on innovative research and technologies to support the criminal justice system. This research and development should not simply be confined to higher education institutes. Despite the existence of Innovate UK’s Forensic Science Knowledge Transfer Network²⁸³, we are not aware of any Government policies or initiatives to improve the landscape for forensic science research and development.

153. Over recent months, the forensic science landscape has received increasing attention, for example at the Royal Society’s two day event in February 2015 entitled ‘The paradigm shift for UK forensic science’ and in BBC Radio 5 Live’s 30 minute discussion of the topic on 4 February 2015.

154. The Home Office’s lack of progress in producing a forensic science strategy is symptomatic of its failure to oversee responsibly the changing forensic science landscape. Forensic science is a key element of the criminal justice system: a Government forensic science strategy, covering issues such as research and

²⁷⁵ Science and Technology Committee, Seventh Report of Session 2010–12, [The Forensic Science Service](#), HC 855, para 245

²⁷⁶ Science and Technology Committee, Second Report of Session 2013–14, [Forensic Science](#), HC 610, paras 111-113 and para 116

²⁷⁷ [The Government response to the Second Report from the House of Commons Science and Technology Committee Session 2013-14 HC 610: Forensic science](#) (November 2013), p17

²⁷⁸ Q151

²⁷⁹ Home Office (BIO 038)

²⁸⁰ Q158

²⁸¹ Home Office (BIO 038)

²⁸² Science and Technology Committee, Second Report of Session 2013–14, [Forensic Science](#), HC 610, para 116 b)

²⁸³ Innovate UK’s [Forensic Science Knowledge Transfer Network](#), accessed 4 February 2015

development, is desperately needed to ensure that the criminal justice system is not adversely affected in the future.

155. A wide range of stakeholders has an interest in forensic science and biometrics and Mr Pratt, Director of Science, Engineering and Technology in the Home Office, told us that many of those stakeholders are represented in the department’s forensic and biometric policy group.²⁸⁴ We note, however, from Mr Pratt’s evidence, that the Ministry of Justice itself does not appear to be represented on the forensic and biometric policy group. **It is imperative that forensic science receives ministerial oversight from the Ministry of Justice as well as the Home Office. Such ministerial oversight should, ideally, sit with one individual to ensure that the criminal justice system is not prejudiced by the changing forensic science landscape. We recommend that the Government, in its response to this report, explain where ministerial responsibility for forensic science lies within the Ministry for Justice and what steps are being taken to protect the integrity of forensic evidence submitted to the courts.**

156. In follow-up written evidence, Lord Bates explained that he is “not proposing to publish the minutes” of the Forensic and Biometric Policy Group’s meetings because “the focus of the Group has shifted, over time, towards ongoing policy discussion”.²⁸⁵ **We remind the Home Office of the Government’s transparency aims and recommend that minutes of all meetings of the Forensic and Biometric Policy Group are published.**

Forensics market

157. Our second inquiry into forensic science in 2013 underlined the lack of information that is available on the total size of the forensic science market, and in particular police “in-house” spending on forensic services,²⁸⁶ and the risk this poses to the stability of the market. Lord Bates told us that the Government “recognise[s] that we could get better in arriving at that data if there was more transparency in how police forces accounted for in-house provision of forensics”.²⁸⁷ Despite this, the Minister was “quietly confident”²⁸⁸ about the health of the forensic science market.

158. In preparation for this Report, we requested that the National Audit Office (NAO) produce a short paper on the Home Office’s oversight of the forensic science market.²⁸⁹ Two of the NAO’s key findings were that:

- The data available publicly on forensics spending is limited. The information that is available is incomplete, inconsistent and/or difficult to access.
- Police forces are undertaking more forensics work internally and this could undermine the market.²⁹⁰

²⁸⁴ Q157

²⁸⁵ Home Office (LEG 018), p1

²⁸⁶ Science and Technology Committee, Second Report of Session 2013–14, [Forensic Science](#), HC 610, p60

²⁸⁷ Q167

²⁸⁸ Q180

²⁸⁹ National Audit Office, [The Home Office’s oversight of forensic services](#) (December 2014)

²⁹⁰ National Audit Office, [The Home Office’s oversight of forensic services](#) (December 2014), paras 4 and 7

159. The NAO quoted figures from the Chartered Institute of Public Finance and Accountancy that estimate the police “in-house” market, in 2014-15, to be one and half times the size of the private sector market (£122 million versus £81 million).²⁹¹ The NAO reasoned that “if suppliers did pull out of the market this could present a risk of service interruption, and lack of capacity could hold up criminal cases or cause them to collapse”.²⁹²

160. The NAO’s warning echoes oral evidence provided by Dr Gillian Tully in 2011, then in her role as Research and Development Manager, Forensic Science Service, and who is now the Forensic Science Regulator. When asked whether there was a risk of murderers and rapists escaping justice because of the closure of the Forensic Science Service, Dr Tully gave an example of the expertise of the Forensic Science Service leading to an individual, initially acquitted of a stabbing, being convicted at a retrial. Dr Tully added that “many years can be saved and justice can be brought about more quickly and efficiently” where forensic science services are provided by experienced experts who have the opportunity to undertake a holistic analysis of criminal evidence.²⁹³

161. We are disappointed that the Government has not made any progress in improving the quality of police spending data since our last report. Unlike the Minister, we are not “quietly confident” about the health of the forensic science market; we believe that the Government’s and police procurement processes need a complete overhaul.

Forensic service regulator’s powers

162. In 2011 we urged the Government to bring forward proposals to provide the regulator with statutory powers “immediately”.²⁹⁴ In November 2013, the Government eventually launched a consultation on ‘New statutory powers for the Forensic Science Regulator’.²⁹⁵ The consultation closed on 3 January 2014 and no further information has been published since. Alan Pratt, Director of Science, Engineering and Technology in the Home Office, explained that “there was a strong view from the people we consulted that there is merit in having a statutory basis for regulatory powers in this area [enforcement of quality standards]”.²⁹⁶ He also explained that, with a new regulator coming into post in November 2014, it was felt that she should have the opportunity “to consult widely with the network of people whom she will be regulating and to consider the range of options that were coming out of the public consultation. That is happening now and it is the intention, as I understand it, to publish”.²⁹⁷ Lord Bates added that these were “more conversations to make sure that these are exactly the powers that she wants”.²⁹⁸ In follow-up written evidence, he explained that the consultation indicated “a general view that the Regulator

²⁹¹ National Audit Office, [The Home Office’s oversight of forensic services](#) (December 2014), paras 22 and 24

²⁹² National Audit Office, [The Home Office’s oversight of forensic services](#) (December 2014), para 27

²⁹³ [Oral evidence](#) taken on 23 March 2011, HC (2010-12) 855, Q52 [Dr Tully]

²⁹⁴ Science and Technology Committee, Seventh Report of Session 2010–12, [The Forensic Science Service](#), HC 855, para 129 and Science and Technology Committee, Second Report of Session 2013–14, [Forensic Science](#), HC 610, para 51

²⁹⁵ HM Government, [New statutory powers for the Forensic Science Regulator](#), accessed 24 January 2015

²⁹⁶ Q182

²⁹⁷ Q182

²⁹⁸ Q184

should have statutory powers in relation to traditional forensic areas such as DNA, fingerprints, fibres and the presence of drugs. However, there is a range of views on whether other areas such as facial identification, CCTV analysis and several other disciplines should be included”.²⁹⁹

163. Private sector forensic service providers have repeatedly told us that one advantage police “in-house” providers enjoy is that they do not have to be accredited to the relevant international quality standards. Lord Bates told us that “32 [out of 43] forces are accredited for DNA, 13 for fingerprint enhancement and 16 have applications in progress for fingerprint enhancement”.³⁰⁰ The Forensic Science Regulator’s Codes of Practice and Conduct for forensic science providers and practitioners in the Criminal Justice System³⁰¹ sets out the standards to which all providers of forensic science services should be accredited. We note that accreditation standards are cited in the NAO’s paper as one cause of the “unequal playing field” between police “in-house” and private sector forensic service providers.³⁰²

164. The Government has made poor progress in ensuring that *all* police “in-house” forensic service providers are accredited to the same standards as private sector providers for *all* of the services that they provide.

165. The Home Office’s discussions to make sure the new powers are exactly what the new regulator wants are an example of the Home Office’s unusual approach to policy making: private conversations undermine the value and credibility of the department’s previous consultation exercise. *We recommend that the Home Office publishes minutes of the meetings it holds with the new forensic science regulator regarding this issue.*

166. The Government’s continued delay in giving the Forensic Science Regulator statutory powers is inexcusable. It is one of the Government’s many failings in forensic science and one which they could have remedied by laying legislation before Parliament.

167. *We strongly recommend that our successor committee pursue the matter of forensic science with the next government as we remain concerned that cases will emerge where injustices have occurred.*

²⁹⁹ Home Office (LEG 018), p1

³⁰⁰ Q155

³⁰¹ Forensic Science Regulator, [Codes of Practice and Conduct for forensic science providers and practitioners in the Criminal Justice System](#) (August 2014), p4

³⁰² National Audit Office, [The Home Office’s oversight of forensic services](#) (December 2014), para 26 b)

Conclusions and recommendations

Scientific advice and Government

1. How the President receives independent scientific advice with respect to EU legislation may be of interest to our successor Committee. (Paragraph 16)
2. Our successor committee may wish to consider such an inquiry early in the next Parliament given that it may require an extended piece of work that becomes less tenable as the Parliament progresses. (Paragraph 17)
3. We are conscious that the challenging financial landscape is likely to persist for a number of years and, in light of the Government's Science and Innovation Strategy and spending review 2015 settlements, our successor committee may wish to take a more detailed look at the effects on science and technology of constrained public finances across all government departments as well as challenging the curious definition of 'science' in that strategy. (Paragraph 19)
4. We have found that a lack of long-term funding for fundamental (data building and conservation) research poses risks to our 'infrastructure of knowledge', an issue we encountered particularly in respect of marine science. Given continuing spending constraints, we expect that this will be an ongoing issue during the next Parliament. (Paragraph 21)
5. The role of Government in leading national debate on issues such as climate change and genetically modified crops will be undermined if it cannot point to transparent, authoritative and independent science that the public can trust. (Paragraph 25)
6. We recommend that our successor Committee keep a watching eye on science qualifications and how schools and universities develop the scientists and engineers we so desperately need. (Paragraph 28)
7. Despite the Government officially advocating the importance of scientific advice and evidence as a key input in the policymaking process, our work during this Parliament has demonstrated, on a number of occasions, that this is not always reflected in Government practice. The use of scientific research and analysis in policymaking is generally understood and practised by certain departments, for example the Department of Health and the Department for Business, Innovation & Skills. However other departments, notably the Department for Education, the Department for Environment, Food & Rural Affairs and the Home Office, appear either not to appreciate the value of scientific advice and evidence in policymaking or simply do not have the capability, experience or processes in place to utilise it. This remains of great concern to us. (Paragraph 29)

Cabinet Office

8. We welcome the Administrative Data Research Network and the associated research centres but note the lack of any commitment to allocating ministerial oversight to the use of social science. It remains our position that both the commission and

utilisation of social science by Government would benefit from direct Ministerial responsibility. (Paragraph 37)

Business, Innovation and Skills

9. We agree with the Minister and urge that this same view continues within Government to ensure that scientific evidence and advice is at the heart of policymaking. (Paragraph 38)
10. We note the piecemeal relocation of roles and responsibilities from the Department for Business, Innovation & Skills to the Cabinet Office and vice-versa and consider that it dilutes the source of scientific advice in government. We, again, strongly reiterate our recommendation that GO-Science should sit within the Cabinet Office so that it benefits from scientific advice and evidence being at the centre of government. (Paragraph 40)
11. We strongly support the Minister's position regarding science funding and urge this Government and its successor to deliver on the Minister's commitments. Science funding and the 2015 spending review will undoubtedly interest our successor committee. (Paragraph 42)
12. We welcome the additional funding that the high value manufacturing Catapult will receive from the Government. At the same time we remind the Government that one of the intrinsic values of the Catapult centres is that they operate independently from other government research and commercialisation initiatives and higher education institutions, and should continue to do so. (Paragraph 44)
13. The innovation infrastructure developed by this Government is a solid starting ground for progress to be realised. We agree with Greg Clark that it will take time to judge the success of the Government's policies to assist businesses to commercialise research and to grow. (Paragraph 45)
14. We recommend that the Government set out, in its response to this Report, what work is being done to increase small and innovative companies' access to equity markets and to measure the impact of Catapult centres on increasing the finance available to SMEs, as we mention in paragraph 23 of this Report. (Paragraph 46)
15. Although there has been some progress in the proportion of Government contracts awarded to SMEs and innovative businesses, there is still much progress to be made to ensure that these businesses have equal access to public sector contracts. There is an added incentive for government to procure from small businesses that it has indirectly funded, for example through Catapult centres, to ensure a positive return on the public investment. (Paragraph 49)
16. There is still a long way to go until women and minority groups are adequately represented in higher education institutions and on the management boards of Catapult centres. We were encouraged by the Minister's strong statements on this matter and the Government should set out, in its response to this Report, what action it is taking to address this issue, what progress is being made and how it will monitor progress going forward. We note that none of the six preferred candidates chosen during this Parliament for us to consider at pre-appointment have been

women. In the interests of transparency, we recommend that each Government Department publish suitably aggregated equality data on candidates shortlisted for appointment to posts subject to pre-appointment hearings by Parliament. (Paragraph 54)

17. The Government's Space for Smarter Government Programme is a welcome initiative and we encourage the next Government to harness the opportunities that space technology offers the public sector. (Paragraph 55)
18. We are comforted by Greg Clark's view that the UK having a director-level representative at the European Space Agency (ESA) has been understood and well taken by the leadership of ESA. We hope that this will result in an actual UK appointment at the upcoming reshuffle of the ESA's management. (Paragraph 56)
19. While we welcome the Government's investment in the Square Kilometre Array, the Science & Technology Facilities Council's withdrawal from a number of northern hemisphere research-grade telescopes remains of great concern. We note that the drop in astronomy and particle physics funding following the 2007 reorganisation of the Particle Physics and Astronomy Research Council has been perpetuated. We ask that the Government re-examine the funding decisions made in these areas of science. Our successor Committee should be informed as to any change in policy in this regard. (Paragraph 58)

Education

20. We welcome Oliver Letwin's response and request that the Government update us on the action it is taking on this matter and its outcomes. (Paragraph 59)
21. We hope that Nick Gibb's assertion that the department's new CSA will ensure that the department uses rigorous evidence in policymaking proves true and that the CSA is able to achieve this in just one day a week. (Paragraph 60)
22. We accept that the public finances have faced cuts under this Government, however a 63% cut in the department's research spending between 2008-09 and 2011-12, and a 59% cut in 2013-14 against the 2008-09 baseline, is drastic by any measure. What is more, the department has pushed through radical reforms to the education system under this Government: although the Government recognises the importance of research in the context of education in its Science and Innovation Strategy, we conclude that evidence is still not as central to the department's policymaking as it should be. (Paragraph 62)
23. Despite the apparent popularity of "exhortation" at the Department for Education, at the expense, it appears, of Government "facilitation", and despite our numerous interactions with the department during this Parliament, we are none the wiser as to what "exhortation and facilitation" means in practice and what benefits result from it. Furthermore, we are not convinced that Ministers are unable to pursue their policy aims by means other than "exhortation and facilitation". We recommend that Ministers exercise their authority to ensure that the policies they support are delivered by the relevant agencies. (Paragraph 63)

24. This view of the science education community reflects a flawed approach to engaging with science education experts throughout the reforms process. We continue to be highly concerned about how evidence is collated and used to inform policy in the Department for Education. (Paragraph 66)
25. The Government and Ofqual should update our successor Committee on developments in this area. (Paragraph 69)
26. The Government's approach to science facilities in schools is wholly unsatisfactory. Whether it be practical science examinations, science field work and field trips, laboratory apparatus, technicians or school buildings, there is a chronic failure by the Government to create an effective environment for practical science in schools. We strongly recommend that this is pursued during the next Parliament. (Paragraph 74)
27. Although the Government promised to upskill the country's science teachers, evidence from the Royal Society, Field Studies Council and SCORE suggests there is still significant work to do. (Paragraph 75)
28. We agree with the Government that there is much work to be done to ensure that young people receive high quality careers advice that will enthuse them to pursue a career in engineering. Unlike the Minister, we consider this country's shortage of engineers to be more than just a "messaging issue". (Paragraph 78)
29. The Minister did not give us confidence that research councils carry out outreach activities in schools to inspire children to study the sciences. He did, however, agree that the National Schools' Observatory carries out valuable work in enthusing children about science: we recommend that our successor committee ensure that it is sufficiently funded to continue doing so. (Paragraph 81)

Environment, Food and Rural Affairs

30. Five years after publication of its marine science strategy, and nearly two years after we made recommendations on this issue, we are dismayed that the Government is yet to have a formal implementation plan for its marine science strategy. (Paragraph 82)
31. While we would normally applaud the efforts made by the Government to compile a better evidence base for marine conservation zones (MCZs), in this case the Government has muddied the water. Does designation of an area as a MCZ require the 'best available evidence', 'robust evidence' or evidence that provides 'reasonable certainty'? In conservation terms, the delay caused by evidence collections means a greater risk that the marine feature will become more degraded: MCZs should be designated ahead of any 'further analysis', as was intended by the original legislation. As part of developing a coherent network of marine protected areas there may also be value in protecting areas where significant features no longer exist but have done previously. (Paragraph 85)
32. Marine conservation zones are a prime example of why the Government needed an implementation plan for its marine science strategy. Although its approach does seem to be slowly improving, the Government continues to muddle through the

marine conservation zone process and needs to make a greater effort to involve all stakeholders from the early stages of the designation process. (Paragraph 87)

33. The process of designating marine conservation zones has endured significant delays. The department went to consultation on the second tranche of MCZs at the end of January 2015; it is hugely optimistic for the Government to think that it will complete designation of their third, and final, tranche in 2016. (Paragraph 88)
34. We agree with the Minister that long-term research and data collection requires security of funding in the long term. (Paragraph 89)
35. We welcome the Government Chief Scientific Adviser's recognition of the importance of long-term data collection and the National Oceanography Centre's involvement in the Government's thematic review, although we remain disappointed by the time it has taken to conduct the review. We recommend that the Government conclude and publish its thematic review urgently. (Paragraph 90)
36. We are disappointed that more progress has not been made since our report and that the use of industry data is only "gradually moving forward". We remind the Government of the lack of data it holds on the marine environment, highlighted only too well by its designation process for marine conservation zones, and urge it to step up its collaboration with industry in this area. (Paragraph 93)
37. In contrast to the Government, we do not think that having only one representative of industry sitting on the Marine Science Co-ordination Committee is sufficient. More direct engagement with the marine industry may encourage more rapid progress in data sharing. (Paragraph 94)
38. Although we acknowledge the importance of ensuring data is collected on a consistent and coherent basis, we note that both initiatives Mr Green refers to are about designing protocols rather than actually collecting data. (Paragraph 95)
39. We find George Eustice's assertion particularly troubling. In the absence of an evidence base, taking comfort from "less evidence of resistance developing" in the veterinary profession verges on recklessness. (Paragraph 96)
40. We are not convinced that the department has made any real progress since our original report on plugging its antimicrobial resistance evidence gap, nor do we feel that it has a firm grasp on the extent of the work it has to do and the time it will take. This may be an area of interest for our successor committee. (Paragraph 97)
41. We recommend the Government fill the evidence gap that has been identified and, early in the new Parliament, report to our successor Committee on how it has acted on the findings set out in the Minister's update to us. (Paragraph 98)
42. Innovation in the water industry and its effect on water security may be an area of interest for our successor committee. (Paragraph 99)

Health

43. We were surprised that neither Minister appeared to appreciate the role of a science advisory council. It is precisely because the Department of Health has so many science advisory bodies that, under the Code of Practice for Scientific Advisory Committees, it would be good practice for it to have a science advisory council co-ordinating the work of the department's science advisory bodies and their advice to the Government. (Paragraph 101)
44. We do not disagree that patient benefit should be at the heart of the healthcare system, but we are concerned that the Ministers do not appreciate the different functions of a CSA and CMO. Filling the posts of CSA and CMO with the same person deprives the government of having two leading scientific voices in the department. (Paragraph 104)
45. We recommend that the department ensures that filling the roles of Chief Medical Officer and Chief Scientific Adviser with the same person does not limit the potential challenge of policy through rigorous scientific advice. We further recommend that the department review its structures for the provision of scientific advice to ensure that they are as effective as possible and reflect good practice. (Paragraph 105)
46. Although we are not as convinced as the Minister that innovation is “right at the heart” of the NHS’ forward view, we are comforted that the Government recognises the opportunity offered by innovative technology in our healthcare system and now appears to be taking proactive steps to exploit that opportunity. We recommend that the Government update our successor committee on the progress of the Innovative Medicines and MedTech Review, the work of the Department of Health’s new directorate of innovation, technology and growth and the department’s involvement in the Small Business Research Initiative within six months of this Report and explain how it intends to implement the recommendations of that review. (Paragraph 110)
47. We have seen no evidence that the Department of Health has effective processes and advisory structures in place to ensure that the allocation of research funding is best aligned with the most valuable science. This is even more relevant given the “new landscape” referred to by the Minister and the Government’s Science and Innovation Strategy. We recommend that the department review how it currently allocates research funding, whether this is fit for future needs, and report to our successor committee on both the findings of this review and the changes to be made as a result. (Paragraph 113)
48. Based on our previous discussions with the Government on antimicrobial resistance, we are satisfied that the Government appreciates the scale of the challenges ahead. Although we are reassured that the Government recognises the importance of responsible prescribing of antimicrobial drugs, the Government has significant work to do to reverse the recent trend of increased antimicrobial prescribing. (Paragraph 117)
49. We welcome the Government’s fledgling efforts to develop joined-up policy in this area but they do not yet appear to be translating into meaningful engagement with

the pharmaceuticals industry. We recommend that the Office for Life Sciences immediately and directly engages with the pharmaceutical industry to ensure that industry's interests are effectively incorporated into Government policy on antimicrobial resistance. (Paragraph 120)

50. We remind the Government that the development of new antimicrobial drugs is not sufficient in itself. Responsible husbandry of existing and future drugs is essential to ensure that the UK successfully manages the challenge of antimicrobial resistance. This may almost certainly mean a new pricing policy. (Paragraph 121)
51. Given the lack of explanation of the work that the Government tells us is currently being conducted, we can only assume that very little analysis of explanted medical implants is actually taking place. (Paragraph 124)
52. The Government has made improvements to the regulation of medical implants without addressing one of the key risks associated with them, namely the lack of primary data relating to new and updated devices. This poses a public health risk. Our successor committee may wish to revisit this topic in light of the changing regulatory regime. (Paragraph 126)

Government Office for Science

53. The Government Chief Scientific Adviser is directly involved in the appointment of departmental Chief Scientific Advisers. We strongly recommend that he ensures that those departments without CSAs fill the post as soon as practicable with suitably qualified independent individuals who will dedicate at least three days a week to the role, as recommended by the House of Lords Science and Technology Committee. We further recommend that the Government Chief Scientific Adviser works with government departments to ensure their scientific advisory structures are fit for purpose. (Paragraph 130)
54. Publishing the outputs of the Government's Horizon Scanning Programme Team at least a year after they have been completed is simply not good enough. We recommend the government publish horizon scanning papers within a month of completion. (Paragraph 131)
55. Putting aside the fact that we prefer the term "futures analysis" to horizon scanning, we are deeply concerned that the Government's Horizon Scanning Programme team is not looking to the future at all and that, by the time its work is published, it may be outdated. Furthermore, its work and operations are not transparent and, although the Government tells us that it is consulting widely as part of its horizon scanning activities, we are disappointed that there is no external representation on the Horizon Scanning Oversight Group. We are also confused as to why the Government's professed 'horizon scanning' takes place separately from the work of the Foresight Unit and see benefits from the two working in a more integrated way. We recommend that the Foresight Unit and the Horizon Scanning Programme Team form one central source of government horizon scanning. Locating GO-Science in the Cabinet Office would facilitate this. (Paragraph 134)

56. We are encouraged that Sir Mark has been directly involved in this year's update of the national risk assessment and that a review of the assessment process is ongoing. We remind the Government of our recommendations regarding the input of scientific advice and evidence into the national risk assessment. We recommend that the Government sets out, in its response to this Report, its process for gathering and assessing the information that is involved in the national risk assessment as well as when and how a risk on the national risk assessment is triggered. (Paragraph 135)
57. The Government has made progress in how scientific advice is incorporated into the national risk assessment and in SAGE guidance. We do, however, remind the Government of the need for SAGE to be as transparent as possible. We recommend that all of the output of SAGE meetings, minutes and other papers, be published as soon as possible after an emergency situation ends. We also recommend that the Government formally review the effectiveness of recent SAGEs and their compliance with the Government's Enhanced SAGE Guidance and publish the findings of this review. (Paragraph 139)
58. We do not dispute that the public is aware of climate change; however, our inquiry focused on how climate science is communicated and the content of that communication, which can have a dramatic effect on the public's understanding and perception of the issue. Although we welcome DECC's use of social media, we do not feel that climate science can be effectively communicated in 140 characters. Organisations such as the Science Media Centre and media fellowships at the British Science Association may provide opportunities for government collaboration with media professionals. (Paragraph 141)
59. The Committee has also been concerned that in order to communicate climate change effectively the whole of government should use one agreed definition. When this was put to Sir Mark Walport we were surprised at his answer "... if you look at any dictionary definition, you will mostly find three or four related ways of expressing it. There is no single biblical legislative definition, and all of these things need to be framed". (Paragraph 142)
60. The Government has made little progress in improving its communication of science. Science is neither lexicography nor scripture and for it to be communicated effectively there should be an agreed scientific definition of climate change. We are disappointed that nearly a year after our report on communicating climate science, DECC has not even agreed the terms of reference for its climate change communications group. We urge the next Government to systematically review how it can best communicate science to the public. This may be an area of interest for our successor committee. (Paragraph 143)
61. We were encouraged that the Government Chief Scientific Adviser recognises the value of funding public engagement. We recommend that the Government protect Sciencewise's funding and consider using Sciencewise as a channel through which scientific advice and evidence is communicated to the public, even where that evidence and advice is contrary to government policy. (Paragraph 144)

Home Office

62. Lord Bates added that “we cannot detect that there has been any diminution of the overall forensic science capability in the country. If anything, it has probably been enhanced by plugging it into a broader network internationally”. The Government should, in its response to this Report, set out the evidence on which the Minister based this statement. (Paragraph 147)
63. Given the department’s previous approach to using scientific advice and evidence, we are concerned that Ministers in the department are still not receiving the level of scientific advice and evidence on this matter that they require. We recommend that the Home Office reviews its governance structures for ensuring scientific advice and evidence is fully integrated into policymaking and ensures that scientific advice and evidence is effectively incorporated into government policy. (Paragraph 148)
64. We request that the Home Office’s Chief Scientific Adviser writes to our successor committee to reassure it that he is aware of the scientific risks posed by the changing forensic science landscape and that he is actively engaged with the policy development in this matter. (Paragraph 149)
65. The Home Office’s lack of progress in producing a forensic science strategy is symptomatic of its failure to oversee responsibly the changing forensic science landscape. Forensic science is a key element of the criminal justice system: a Government forensic science strategy, covering issues such as research and development, is desperately needed to ensure that the criminal justice system is not adversely affected in the future. (Paragraph 154)
66. It is imperative that forensic science receives ministerial oversight from the Ministry of Justice as well as the Home Office. Such ministerial oversight should, ideally, sit with one individual to ensure that the criminal justice system is not prejudiced by the changing forensic science landscape. We recommend that the Government, in its response to this report, explain where ministerial responsibility for forensic science lies within the Ministry for Justice and what steps are being taken to protect the integrity of forensic evidence submitted to the courts. (Paragraph 155)
67. We remind the Home Office of the Government’s transparency aims and recommend that minutes of all meetings of the Forensic and Biometric Policy Group are published. (Paragraph 156)
68. We are disappointed that the Government has not made any progress in improving the quality of police spending data since our last report. Unlike the Minister, we are not “quietly confident” about the health of the forensic science market; we believe that the Government’s and police procurement processes need a complete overhaul. (Paragraph 161)
69. The Government has made poor progress in ensuring that all police “in-house” forensic service providers are accredited to the same standards as private sector providers for all of the services that they provide. (Paragraph 164)

70. The Home Office's discussions to make sure the new powers are exactly what the new regulator wants are an example of the Home Office's unusual approach to policy making: private conversations undermine the value and credibility of the department's previous consultation exercise. We recommend that the Home Office publishes minutes of the meetings it holds with the new forensic science regulator regarding this issue. (Paragraph 165)
71. The Government's continued delay in giving the Forensic Science Regulator statutory powers is inexcusable. It is one of the Government's many failings in forensic science and one which they could have remedied by laying legislation before Parliament. (Paragraph 166)
72. We strongly recommend that our successor committee pursue the matter of forensic science with the next government as we remain concerned that cases will emerge where injustices have occurred. (Paragraph 167)

Formal Minutes

Wednesday 11 March 2015

Members present:

Andrew Miller, in the Chair

Jim Dowd
Stephen Metcalfe
Stephen Mosley

Pamela Nash
Graham Stringer
David Tredinnick

Draft Report (Legacy–Parliament 2010-15), proposed by the Chair, brought up and read.

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

Paragraphs 1 to 35 read and agreed to.

Annexes and Foreword 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.

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

[The Committee adjourned.]

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the Committee's inquiry page at www.parliament.uk/science.

Wednesday 3 December 2014

Question number

Jane Ellison MP, Parliamentary Under-Secretary of State for Public Health, Department of Health,

George Freeman MP, Parliamentary Under-Secretary of State for Life Sciences, Department of Health, and

Professor David Walker, Deputy Chief Medical Officer for England, Department of Health

[Q1-36](#)

Nick Gibb MP, Minister of State for School Reform, Department for Education

[Q37-90](#)

Wednesday 14 January 2015

George Eustice MP, Parliamentary Under-Secretary of State for Farming, Food and Marine Environment, Department for Environment, Food and Rural Affairs, **Terence Illott**, Deputy Director, Marine Environment Strategy, Department for Environment, Food and Rural Affairs, and

Paul Green, Operations Director, Veterinary Medicines Directorate

[Q91-141](#)

Lord Bates, Parliamentary Under-Secretary of State for Criminal Information, Home Office, and **Alan Pratt**, Director of Science, Engineering and Technology, Home Office

[Q142-201](#)

Wednesday 28 January 2015

Rt Hon Greg Clark MP, Minister of State for Universities, Science and Cities, Department for Business, Innovation and Skills

[Q202-273](#)

Professor Sir Mark Walport, Government Chief Scientific Adviser, Government, Office for Science

[Q274-339](#)

Published written evidence

The following written evidence was received and can be viewed on the Committee's inquiry web page at www.parliament.uk/science. LEG numbers are generated by the evidence processing system and so may not be complete.

1	The Royal Society	LEG0001
2	Faculty of Pharmaceutical Medicine	LEG0002
3	Christopher Roy-Toole	LEG0003
4	Association of the British Pharmaceutical Industry (ABPI)	LEG0004
5	Field Studies Council (FSC)	LEG0005
6	SCORE	LEG0006
7	The Geological Society	LEG0007
8	Department of Health: Public and professional awareness initiatives including delayed or back up prescribing	LEG0008
9	Department for Business Innovation & Skills and Department of Health: Appraisal Alignment Working Group (AAWG)	LEG0009
10	Department for Business Innovation & Skills and Department of Health: Innovative Medicines and MedTech Review	LEG0010
11	Department for Business Innovation & Skills and Department of Health: Medical devices	LEG0011
12	Cabinet Office: Census and Social Science	LEG0012
13	Department of Health: Blood safety and risk of vCJD	LEG0013
14	Department of Energy & Climate Change: Communicating Climate Science	LEG0014
15	Cabinet Office: Government Horizon Scanning	LEG0015
16	Lilly UK	LEG0016
17	Department of Energy & Climate Change: Risk perception and energy infrastructure	LEG0017
18	Home Office: Cyber crime and forensics	LEG0018
19	Government Office for Science: SAGE Secretariat	LEG0019
20	Department for Business Innovation & Skills: Rt Hon Greg Clark MP	LEG0020

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the Committee's website at www.parliament.uk/science.

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

Session 2014–15

First Special Report	Communicating climate science: Government Response to the Committee's Eighth Report of Session 2013–14	HC 376
First Report	Ensuring access to working antimicrobials	HC 509 (Cm 8919)
Second Special Report	Government horizon scanning: Government Response to the Committee's Ninth Report of Session 2013–14	HC 592
Second Report	After the storm? UK blood safety and the risk of variant Creutzfeldt-Jakob Disease	HC 327 (Cm 8940)
Third Special Report	Ensuring access to working antimicrobials: Research Councils UK Response to the Committee's First Report of Session 2014–15	HC 643
Third Report	National Health Screening	HC 244 (Cm 8999)
Fourth Report	Responsible Use of Data	HC 245 (HC 1086)
Fifth Report	Advanced genetic techniques for crop improvement: regulation, risk and precaution	HC 328
Sixth Report	Current and future uses of biometric data and technologies	HC 734
Seventh Report	Royal Botanic Gardens, Kew	HC 866
Eighth Report	Pre-appointment hearing with the Government's preferred candidate for Chair of the Biotechnology and Biological Sciences Research Council (BBSRC)	HC 1087
Fourth Special Report	Responsible Use of Data: Government Response to the Committee's Fourth Report of Session 2014–15	HC 1086

Session 2013–14

First Special Report	Educating tomorrow's engineers: the impact of Government reforms on 14–19 education: Government Response to the Committee's Seventh Report of Session 2012–13	HC 102
First Report	Water quality: priority substances	HC 272-I (HC 648)
Second Special Report	Marine science: Government Response to the Committee's Ninth Report of Session 2012–13	HC 443
Third Special Report	Bridging the valley of death: improving the commercialisation of research: Government response to the Committee's Eighth Report of Session 2012–13	HC 559
Second Report	Forensic science	HC 610 (Cm 8750)
Fourth Special Report	Water quality: priority substances: Government	HC 648

	response to the Committee's First Report of Session 2013–14	
Third Report	Clinical trials	HC 104 (Cm 8743)
Fifth Special Report	Clinical trials: Health Research Authority Response to the Committee's Third Report of Session 2013–14	HC 753
Fourth Report	Work of the European and UK Space Agencies	HC 253 (HC 1112)
Fifth Report	Pre-appointment hearing with the Government's preferred candidate for Chair of the Natural Environment Research Council (NERC)	HC 702
Sixth Special Report	Forensic science: Research Councils UK Response to the Committee's Second Report of Session 2013–14	HC 843
Seventh Special Report	Clinical trials: Medical Research Council Response to the Committee's Third Report of Session 2013–14	HC 874
Sixth Report	Women in scientific careers	HC 701 (HC 1268)
Seventh Report	Pre-appointment hearing with the Government's preferred candidate for Chair of the Arts and Humanities Research Council (AHRC)	HC 989
Eighth Special Report	Work of the European and UK Space Agencies: Government Response to the Committee's Fourth Report of Session 2013–14	HC 1112
Eighth Report	Communicating climate science	HC 254 (HC 376, Session 2014–15)
Ninth Report	Government horizon scanning	HC 703 (HC 592, Session 2014–15)
Ninth Special Report	Women in scientific careers: Government Response to the Committee's Sixth Report of Session 2013–14	HC 1268
Session 2012–13		
First Special Report	Science in the Met Office: Government Response to the Committee's Thirteenth Report of Session 2010–12	HC 162
First Report	Devil's bargain? Energy risks and the public	HC 428 (HC 677)
Second Report	Pre-appointment hearing with the Government's preferred candidate for Chair of the Medical Research Council	HC 510–I
Second Special Report	Engineering in government: follow-up to the 2009 report on Engineering: turning ideas into reality: Government Response to the Committee's Fifteenth Report of Session 2010–12	HC 511
Third Report	The Census and social science	HC 322 (HC 1053)
Fourth Report	Building scientific capacity for development	HC 377 (HC 907)
Fifth Report	Regulation of medical implants in the EU and UK	HC 163 (Cm 8496)
Sixth Report	Proposed merger of British Antarctic Survey and National Oceanography Centre	HC 699 (HC 906)
Third Special Report	Devil's bargain? Energy risks and the public: Government Response to the Committee's First Report of Session 2012–13	HC 677
Fourth Special Report	Building scientific capacity for development: Government and UK Collaborative on Development	HC 907

	Sciences Response to the Committee's Fourth Report of Session 2012–13	
Fifth Special Report	Proposed merger of British Antarctic Survey and National Oceanography Centre: Natural Environment Research Council Response to the Committee's Sixth Report of Session 2012–13	HC 906
Seventh Report	Educating tomorrow's engineers: the impact of Government reforms on 14–19 education	HC 665 (HC 102, Session 2013–14)
Eighth Report	Bridging the valley of death: improving the commercialisation of research	HC 348 (HC 559, Session 2013–14)
Sixth Special Report	The Census and social science: Government and Economic and Social Research Council (ESRC) Responses to the Committee's Third Report of Session 2012–13	HC 1053
Ninth Report	Marine science	HC 727
Session 2010–12		
First Special Report	The Legacy Report: Government Response to the Committee's Ninth Report of Session 2009–10	HC 370
First Report	The Reviews into the University of East Anglia's Climatic Research Unit's E-mails	HC 444 (HC 496)
Second Report	Technology and Innovation Centres	HC 618 (HC 1041)
Third Report	Scientific advice and evidence in emergencies	HC 498 (HC 1042 and HC 1139)
Second Special Report	The Reviews into the University of East Anglia's Climatic Research Unit's E-mails: Government Response to the Committee's First Report of Session 2010–12	HC 496
Fourth Report	Astronomy and Particle Physics	HC 806 (HC 1425)
Fifth Report	Strategically important metals	HC 726 (HC 1479)
Third Special Report	Technology and Innovation Centres: Government Response to the Committee's Second Report of Session 2010–12	HC 1041
Fourth Special Report	Scientific advice and evidence in emergencies: Government Response to the Committee's Third Report of Session 2010–12	HC 1042
Sixth Report	UK Centre for Medical Research and Innovation (UKCMRI)	HC 727 (HC 1475)
Fifth Special Report	Bioengineering: Government Response to the Committee's Seventh Report of 2009–10	HC 1138
Sixth Special Report	Scientific advice and evidence in emergencies: Supplementary Government Response to the Committee's Third Report of Session 2010–12	HC 1139
Seventh Report	The Forensic Science Service	HC 855 (Cm 8215)
Seventh Special Report	Astronomy and Particle Physics: Government and Science and Technology Facilities Council Response to the Committee's Fourth Report of Session 2010–12	HC 1425
Eighth Report	Peer review in scientific publications	HC 856 (HC 1535)
Eighth Special Report	UK Centre for Medical Research and Innovation (UKCMRI): Government Response to the Committee's	HC 1475

	Sixth Report of session 2010–12	
Ninth Report	Practical experiments in school science lessons and science field trips	HC 1060–I (HC 1655)
Ninth Special Report	Strategically important metals: Government Response to the Committee’s Fifth Report of Session 2010–12	HC 1479
Tenth Special Report	Peer review in scientific publications: Government and Research Councils UK Responses to the Committee’s Eighth Report of Session 2010–12	HC 1535
Tenth Report	Pre-appointment hearing with the Government’s preferred candidate for Chair of the Technology Strategy Board	HC 1539–I
Eleventh Special Report	Practical experiments in school science lessons and science field trips: Government and Ofqual Responses to the Committee’s Ninth Report of Session 2010–12	HC 1655
Eleventh Report	Alcohol guidelines	HC 1536 (Cm 8329)
Twelfth Report	Malware and cyber crime	HC 1537 (Cm 8328)
Thirteenth Report	Science in the Met Office	HC 1538
Fourteenth Report	Pre-appointment hearing with the Government’s preferred candidate for Chair of the Engineering and Physical Sciences Research Council	HC 1871–I
Fifteenth Report	Engineering in government: follow-up to the 2009 report on Engineering: turning ideas into reality	HC 1667 (HC 511, Session 2012–13)