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1st Report of Session 2016–17

A time for boldness: EU membership and UK science after the referendum

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Science and Technology Select Committee

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Evidence is published online at www.parliament.uk/eu-membership-and-uk-science-follow-up and available for inspection at the Parliamentary Archives (020 7129 3074).

Q in footnotes refers to a question in oral evidence.

SUMMARY

The Prime Minister, the Rt Hon Theresa May MP, has stated clearly that she wants a positive outcome for science¹ as the UK leaves the EU. With a view to helping her to achieve this ambition, this report sets out key actions to ensure that UK science continues to flourish.

An uncertain era is a time for boldness not timidity. This is a time for bold steps to prepare the UK for life outside the opportunities and constraints of EU membership and to seek an even more prominent place for this country in the global economy.

The EU referendum created uncertainty for EU scientists in the UK as well as UK scientists in the EU. The prolonged delay in solid reassurances from the Government is having a corrosive effect on the UK science base and could consequently impact on the long-term health of the UK economy. Fortunately, the Government has the ability to mitigate this effect, not least by building on existing networks and mechanisms including Chevening Scholarships, the Newton Fund and the Global Challenges Fund. But, it is not enough to allow talented scientists from around the world to work in the UK: we must attract them vigorously.

To further enhance this country's presence in the world of science, National Academies and the new UK Research and Innovation (UKRI) should be asked by the Government to search the world for outstanding scientific leaders, and attract them to the UK with compelling offers of research funding for their first 10 years in the UK and support for their immediate families as they settle into the UK. Such high profile figures often attract further funding and talent wherever they go.

The Government should consult the science community to identify opportunities to host at least one new international research facility, of a scale comparable to the Francis Crick Institute or the Diamond Light Source in partnership with governments or research funders from other countries.

Reassurances on funding are welcome but if they were to expire, and are not replaced, this would undermine some of the benefit of the major increase announced in the 2016 Autumn Statement. We assume the Government does not intend for this to happen, so we recommend that, in addition to the 2016 Autumn Statement announcement, the science and research budget should be re-based at an early opportunity to compensate fully for any reduction of funding from the EU, in effect adopting the Government's 13 August reassurances into the funding baseline for the science and research budget in future.

The Government will acquire a range of additional regulatory responsibilities during and following Brexit. We recommend that the Government should assess in the short term the administrative structures and scientific advice required to support the regulatory responsibilities in the scientific domain that will transfer from the EU to the UK. The Government must ensure that it has appropriate scientific advice during the Brexit negotiations. The Government should also assess the need for a Chief Scientific Adviser in the Department

1 All academic disciplines in the natural sciences, engineering, medicine, mathematics, social sciences and humanities, as well as related research, innovation and application in academic institutions, charities and industry.

for International Trade, bearing in mind the scale of scientific analysis that underpins international trade regulations and which may be required for trade negotiations.

The Government should explore collaborations and shared protocols in the scientific domain with Governments and funding agencies in major scientific nations, particularly where existing relationships are already strong. The UK-US axis on science stands out as an opportunity worth exploring.

A time for boldness: EU membership and UK science after the referendum

CHAPTER 1: INTRODUCTION

Background

1. In April 2016 we published a report on *EU membership and UK science*.² It aimed to identify and characterise the principal linkages between European Union (EU) membership and the effectiveness of science in the UK.
2. Our report examined the funding given by the EU to UK science and considered other aspects of EU membership, such as freedom of movement of scientists, the EU regulatory framework and the ability to collaborate on major projects. We concluded that these in particular were significant aspects of membership.
3. The overwhelming balance of opinion made known to this Committee from the UK science community during that inquiry valued greatly the UK's membership of the EU—but there were some qualifications to this enthusiasm. Our report consequently highlighted some negative aspects of the UK's EU membership, such as restrictive EU regulations that could inhibit innovative research and the translation of research findings into commercial or social benefits, particularly in the life sciences.
4. In our April report we also concluded that the ease with which talented scientists could move between EU Member States and the UK, the EU's fertile environment for research collaboration, harmonised regulations, access to EU research facilities and the availability of substantial funding for research combined to make EU membership a highly prized feature of the science ecosystem in the UK. We concluded that the UK could lose strategic influence on EU science policy in the event of a vote to leave.
5. Following the 2015 General Election, the new Conservative Government implemented its manifesto pledge by holding a UK-wide referendum on EU membership (“the EU referendum”) on 23 June 2016. On a national turnout of 72%, 51.9% voted for the UK to leave the EU. On 13 July, following the Rt Hon David Cameron's resignation, the Rt Hon Theresa May MP became Prime Minister. She stated during her campaign to become Prime Minister—and after she took office—that “Brexit means Brexit” and that there would be no attempt made by her Government to stay within the EU.³
6. In the table below, we set out some of the key events between the EU referendum and now. We found the report of the House of Commons Select Committee on Science and Technology, *Leaving the EU: implications and*

2 Science and Technology Committee, *EU membership and UK science* (2nd Report, Session 2015–16, HL Paper 127)

3 “Theresa May says “Brexit means Brexit”, *Independent* (11 July 2016): <http://www.independent.co.uk/news/uk/politics/theresa-may-brexit-means-brexit-conservative-leadership-no-attempt-remain-inside-eu-leave-europe-a7130596.html> [accessed 14 November 2016]

opportunities for science and research,⁴ which addressed the high-level issues of funding, people, collaboration, regulation, innovation and infrastructure, particularly interesting.

Table 1: Key events between the EU referendum and publication of this report

Date	Event
23 June	Referendum on UK membership of the EU. 51.9% voted to leave the EU (on a turnout of 72%).
28 June	Jo Johnson MP, Minister of State for Universities, Science, Research and Innovation, issues a statement on higher education and research in the light of the EU referendum result. ⁵ House of Commons Select Committee on Science and Technology launches inquiry, <i>Leaving the EU: Implications and opportunities for science and research</i> . ⁶
18 July	The Prime Minister writes to Professor Sir Paul Nurse (former President of the Royal Society and Chief Executive and Director of the Francis Crick Institute), promising a positive outcome for science during Brexit negotiations. ⁷
26 July	This Committee launches follow up work on EU membership and UK science. ⁸
13 August	The Government announces that it will “underwrite funding for approved Horizon 2020 projects applied for before the UK leaves the EU”. ⁹
2 October	The Prime Minister announces that she will trigger Article 50 to begin the formal Brexit negotiation process by the end of March 2017. She also announces a Great Repeal Bill to end EU law’s primacy in the UK. ¹⁰

4 House of Commons Science and Technology Committee, *Leaving the EU: implications and opportunities for science and research* (Seventh Report, Session 2016–17, HC 502)

5 Department for Business, Innovation and Skills, Statement on higher education and research following the EU referendum, 28 June 2016: <https://www.gov.uk/government/news/statement-on-higher-education-and-research-following-the-eu-referendum> [accessed 8 November 2016]

6 UK Parliament, *Leaving the EU: implications and opportunities for science and research* (28 June 2016): <http://www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/news-parliament-2015/leaving-the-eu-inquiry-launch-16-17/> [accessed 8 November 2016]

7 Letter from the Prime Minister to Sir Paul Nurse, 18 July 2016: <https://drive.google.com/file/d/0BwQ4esYYFC04UnhmRldMbUNralU/view> [accessed 7 December 2016]

8 ‘EU membership and UK science follow-up investigation launched’, *House of Lords Science and Technology Committee* (26 July 2016): <http://www.parliament.uk/business/committees/committees-a-z/lords-select/science-and-technology-committee/news-parliament-2015/eu-uk-science-follow-up/> [accessed 8 November 2016]

9 ‘Safeguarding funding for research and innovation’, *Department for Business, Energy and Industrial Strategy* (13 August 2016): <https://www.gov.uk/government/news/safeguarding-funding-for-research-and-innovation> [accessed 8 November 2016]

10 ‘Brexit begins: Theresa May takes axe to EU laws’, *The Telegraph* (2 October 2016): <http://www.telegraph.co.uk/news/2016/10/01/brexit-begins-theresa-may-takes-axe-to-eu-laws/> [accessed 8 November 2016]

Date	Event
25 October	In oral evidence to this Committee, Jo Johnson MP clarifies that the 13 August funding guarantee by the Government would be met with additional funds and not with money transferred from the existing science budget. ¹¹
3 November	The High Court rules that Parliament must vote on whether the UK can start the process of leaving the EU. ¹² The Government announces it will appeal this decision at the Supreme Court.
18 November	House of Commons Select Committee on Science and Technology publishes report, <i>Leaving the EU: implications and opportunities for science and research</i> . ¹³
21 November	Prime Minister's speech to the Confederation of British Industry (CBI) in which she announces government investment worth £2 billion per year by 2020 for research and development (R&D). ¹⁴
23 November	Autumn Statement in which details of the Prime Minister's announcement of 21 November are confirmed. ¹⁵
5 December	Start of the Government's appeal to the Supreme Court against the High Court judgment of 3 November that Parliament must vote on whether the UK can start the process of leaving the EU. ¹⁶

Our follow up work

7. In July 2016, in the light of the EU referendum result, we decided to conduct a brief investigation to follow up our report on *EU membership and UK science* to assess the implications of that result for science. The core question that we sought to answer was: what actions are needed to ensure UK science continues to flourish as the UK negotiates its exit from the EU and, thereafter, plays an even stronger role in the international competitiveness of the UK?
8. We have drawn on the evidence submitted to us during the course of our earlier inquiry, but we have not rehearsed all the arguments made in that report. Whilst we did not publish a separate call for evidence for this follow up work, we advised those interested in making a written submission to contact the Committee. In total we received 19 written submissions.
9. The Prime Minister has stated clearly that she wants a positive outcome for science as the UK leaves the EU. With a view to helping her to achieve this,

11 [Q 52 \(Jo Johnson MP\)](#)

12 'Brexit court defeat for UK government', *BBC News* (3 November 2016): <http://www.bbc.co.uk/news/uk-politics-37857785> [accessed 8 November 2016]

13 Science and Technology Committee, *Leaving the EU: implications and opportunities for science and research* (Seventh Report, Session 2016–17, HC 502)

14 Prime Minister Theresa May, Speech at the CBI annual conference 2016, 21 November 2016: <https://www.gov.uk/government/speeches/cbi-annual-conference-2016-prime-ministers-speech> [accessed 7 December 2016]

15 HM Treasury, *Autumn Statement 2016* (23 November 2016): <https://www.gov.uk/government/publications/autumn-statement-2016-documents/autumn-statement-2016> [accessed 7 December 2016]

16 'Supreme Court Brexit case: 'No need' for MPs to get final say', *BBC News* (5 December 2016): <http://www.bbc.co.uk/news/uk-politics-38200115> [accessed 7 December 2016]

our supplementary report describes the important and distinctive interests of the UK scientific community in order to inform the Government's negotiation of the UK's exit from the EU.

10. Whilst the evidence we received set out many of the challenges facing UK science after the EU Referendum and emphasised the importance of ensuring that science can flourish in a post-Brexit UK, we received few concrete suggestions for action by the Government. In an attempt to be helpful to the Prime Minister as she seeks to ensure a positive outcome for science, we have made a number of recommendations which were not specifically suggested to us in evidence but which are based on our varied experience of science, business and academia. They are an attempt to bridge the gap between the analysis of the challenges facing science and the desired end point of UK science flourishing post-Brexit.
11. The UK's outstanding reputation and performance in the scientific world depends critically on redoubling efforts to persuade many of the world's most talented scientists to pursue careers in this country. These leading scientists often attract investment from private and charitable institutions as well as the public sector. Uncertainty over the future relationship between EU and UK science is unwelcome to those making career choices or investment decisions. There may be questions about the UK's future relationship with the EU that cannot be answered now. But we heard from witnesses that there is a pressing need for Government to provide early reassurance and confidence to the scientific community. We welcome interventions from National Academies and other institutions with strong relationships with the scientific community, to communicate messages of reassurance from, and concerns to, the Government.

Structure of report

12. The evidence we received during our follow up work clustered around four main themes, which we consider in turn in the following chapters:
 - Funding (Chapter 2);
 - People (specifically the free movement of scientists) (Chapter 3);
 - Facilities, research infrastructure and regulation (Chapter 4); and
 - Potential opportunities offered by Brexit (Chapter 5).
13. Across these themes, we have identified short-, medium- and long-term actions which the Government could realistically take to support the health of UK science during and beyond the process of leaving the EU. The box below sets out our timescale for these different actions.

Box 1: Timescales required for Government action

Short-term actions should be started—but not necessarily completed—before Article 50 is invoked.

Medium-term actions should be started—at the latest—during the two year period between the Article 50 process being started and the UK formally leaving the EU.

Long-term actions should be started either late in the exit negotiations or after the UK has left the EU.

Terminology

14. Throughout this report we have used the term “science”. By this term we mean all academic disciplines in the natural sciences, engineering, medicine, mathematics, social sciences and humanities, as well as related research, innovation and application in academic institutions, charities and industry.

Working methods and acknowledgments

15. Although we did not formally invite written evidence, we received 19 helpful and informative written submissions from, amongst others, international companies, individuals, academic bodies, charities and scientific institutions. We held oral evidence sessions on 19 July, 23 September and 25 October. We thank everyone who provided evidence. The evidence is available on our website.¹⁷
16. The Government has agreed to provide a single response to our report *EU membership and UK science* and to this follow up report.
17. Finally, we would like to thank our Specialist Adviser, Professor Graeme Reid, Chair of Science and Research Policy at University College London, whose expertise was invaluable throughout both our original inquiry and during this follow up investigation.

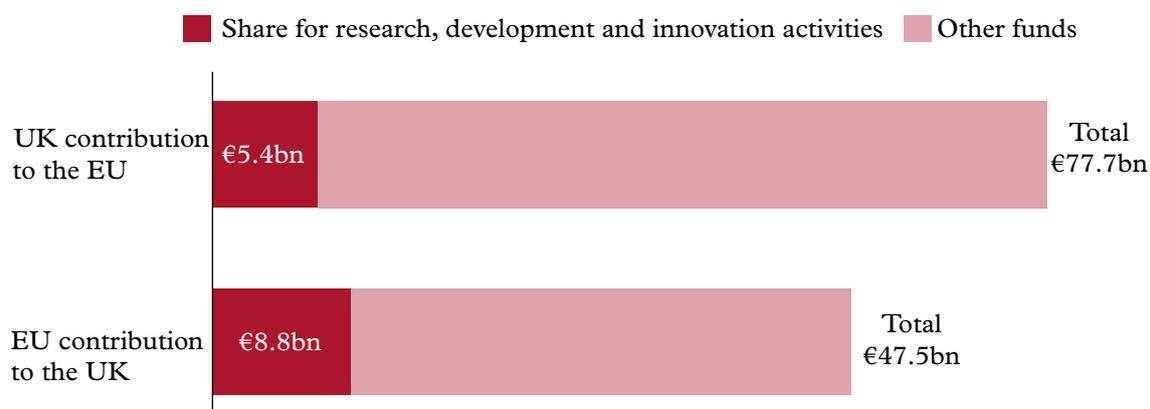
17 Evidence published online is available at: <http://www.parliament.uk/hlscience>

CHAPTER 2: FUNDING

Current EU funding of UK science

18. In our April report on *EU membership and UK science*, we set out the principal mechanisms established by the EU to support science and research.¹⁸ There are five main mechanisms:
- The Horizon 2020 programme (formerly the series of Framework Programmes 1–7);
 - European Structural and Investment Funds (ESIF);
 - Sectoral research and development programmes;
 - Other connected programmes and networks; and
 - Partnerships.
19. As set out in our report, although the UK was a net contributor to the EU overall, it was a net receiver of EU funding for research with just under one fifth (18.3%) of the funds the UK received from the EU from 2007–13 used to support research, development and innovation activities (see Figure 1 below, which is taken from our earlier report).

Figure 1: Flow of funds between the UK and the EU (2007–13)



Source: Written evidence from the Campaign for Science and Engineering (CaSE) ([EUM0047](#)) and the Royal Society ([EUM0067](#))

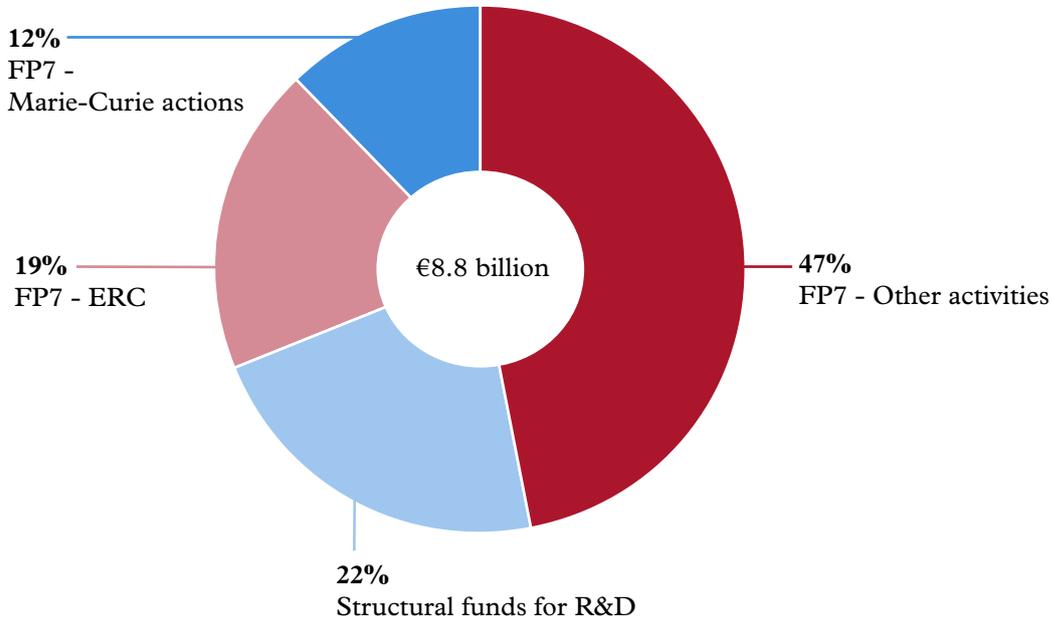
20. As shown in Figure 1, from 2007 to 2013 the UK received €8.8 billion for research, development and innovation from the EU. Over the same period, the UK contributed €5.4 billion for research, development and innovation.
21. €6.9 billion of the funding from the EU to the UK for research, development and other innovation activities was Framework 7 Programme (FP7) funding (see Figure 2), with the university sector by far the largest recipient (see Figure 3). The Committee heard from universities that this funding was equivalent to having another Research Council.¹⁹ However, UK businesses

¹⁸ Science and Technology Committee, *EU membership and UK science* (2nd Report, Session 2015–16, HL Paper 127)

¹⁹ Oral evidence taken on 19 January 2016 (Session 2015–16), [Q 63](#) (Prof Sir Leszek Borysiewicz)

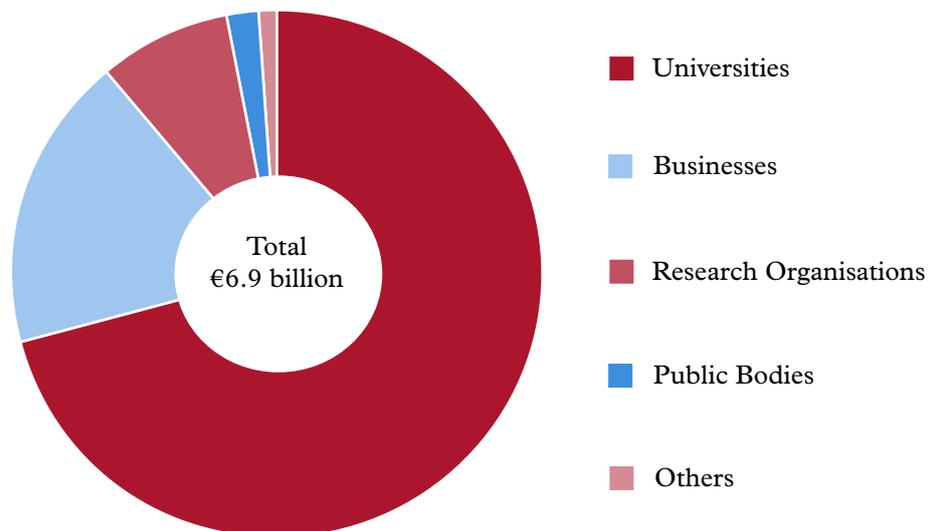
performed below the EU average in participating in FP7.²⁰ EU research funding through FP7 represented 3% of UK expenditure on R&D between 2007 and 2013.²¹

Figure 2: Sources of EU funding to UK research, development and innovation (2007–13)



Source: Royal Society, *UK research and the European Union: The role of the EU in funding UK research* (December 2015): <https://royalsociety.org/~media/policy/projects/eu-uk-funding/uk-membership-of-eu.pdf> [accessed 9 November 2016]

Figure 3: FP7 funding awarded to the UK by sector (2007–13)



Source: Royal Society, *UK research and the European Union: The role of the EU in funding UK research* (December 2015): <https://royalsociety.org/~media/policy/projects/eu-uk-funding/uk-membership-of-eu.pdf> [accessed 9 November 2016]

20 House of Commons, Science and Technology Committee, *Leaving the EU: implications and opportunities for science and research* (Seventh Report, Session 2016–17, HC 502)

21 Royal Society, *UK research and the European Union: The role of the EU in funding UK research* (December 2015): <https://royalsociety.org/~media/policy/projects/eu-uk-funding/uk-membership-of-eu.pdf> [accessed 30 November 2016]

Government commitments post-EU referendum

22. Professor Philip Nelson, Chair of Research Councils UK (RCUK), and Chief Executive of the Engineering and Physical Sciences Research Council (EPSRC), called for the Government to reassure researchers applying for a European Research Council grant under Horizon 2020, which may last five years, that it will be honoured in the future. He said: “Making statements such as that would be enormously helpful to researchers on the ground when they are considering where they should apply for research funding.”²²
23. On 13 August, the Government announced that it would “underwrite funding for approved Horizon 2020 projects applied for before the UK leaves the European Union”.²³ It gave similar reassurances about ESIF projects signed before the Autumn Statement.²⁴ In oral evidence to the House of Commons Science and Technology Committee on 13 July, Jo Johnson MP, Minister of State for Universities, Science, Research and Innovation, said that he had already made statements to clarify the situation and was putting together a communications strategy.²⁵
24. The Minister also told us on 25 October that the funding promised by the Government for approved Horizon 2020 projects applied for before the UK leaves the EU would be new money, “not money from the existing science ring-fence; it is additional resources beyond the £26.3 billion we have already committed for the period 2016–17 to 2020–21. It is an additional commitment from the Treasury to underwrite EU research funding”.²⁶
25. ***The Government’s commitment to underwrite Horizon 2020 funding with new money is significant and welcome. The Government should try to enable scientists in the UK to retain access to Horizon 2020 and other EU funding post-Brexit. In the light of the UK’s science credentials and given that a number of countries outside the EU already have access to this funding, we would expect the EU and the UK Government to agree terms under which this access remains open.***
26. The Association of Innovation Research and Technology Organisations (AIRTO) emphasised that it was important that the Government’s funding commitments were “followed through and that implementation does not fall short of participants’ expectations”.²⁷

Commitments made by the Prime Minister on 21 November

27. In a speech to the CBI on 21 November, the Prime Minister announced that the Government would make real terms increases in government investment worth £2 billion per year by 2020 for R&D, “to help put post-Brexit Britain

22 Q 15 (Prof Philip Nelson)

23 ‘Safeguarding funding for research and innovation’, *Department for Business, Energy and Industrial Strategy* (13 August 2016): <https://www.gov.uk/government/news/safeguarding-funding-for-research-and-innovation> [accessed 8 November 2016]

24 Letter from David Gauke to the Rt Hon David Davis MP, 12 August 2016: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/545767/CST_letter_to_SoS_for_DExEU_August_2016.PDF [accessed 9 November 2016]

25 Oral evidence taken before the House of Commons Science and Technology Committee, 13 July 2016 (Session 2016–17), Q 119 (Jo Johnson MP)

26 Q 51 (Jo Johnson MP)

27 Written evidence from Association of Innovation Research and Technology Organisations (AIRTO) (EUF0008)

at the cutting edge” of science and technological discovery.²⁸ In the Autumn Statement two days later, the Chancellor of the Exchequer, the Rt Hon Philip Hammond MP, confirmed that this money would be channelled through the new National Productivity Investment Fund to UKRI and the new Industrial Strategy Challenge Fund.²⁹

28. **We recognise this major increase in funding as a signal that the Government is putting significantly greater emphasis on science to deliver its long term objectives in addition to any replacement of EU funding. This is a highly encouraging development at a time when the future role of UK Research and Innovation (UKRI) is being considered during the passage of the Higher Education and Research Bill through Parliament.**

Future access to EU funding

29. During the course of this inquiry we received submissions indicating a preference for the UK to find a way to retain access to EU funding post-Brexit. The British Council told us, “The UK should aim to maintain access to mechanisms such as Horizon 2020, and the subsequent Framework Programme as part of its new relationship with the EU, in order to ensure that UK researchers can continue to work with and attract the best researchers across Europe and beyond.”³⁰ Similarly the Campaign for Science and Engineering (CaSE) said that “continued access to EU funding programmes and collaborative opportunities” should be a priority.³¹ In our earlier report we said that one of the ways to retain access to EU funding post-Brexit might be for the UK to gain Associated Country status.³²
30. *Reassurances on funding are welcome but if they were to expire, and are not replaced, this would undermine some of the benefit of the major increase announced in the 2016 Autumn Statement. We assume the Government does not intend for this to happen, so we recommend that, in addition to the 2016 Autumn Statement announcement, the science and research budget should be re-based at an early opportunity to compensate fully for any reduction of funding from the EU, in effect adopting the Government’s 13 August reassurances into the funding baseline for the science and research budget in future.*

Discrimination since the EU referendum?

31. Following the EU referendum there were widespread—but as yet unattributed—reports of UK researchers being dropped from existing EU

28 Prime Minister Theresa May, Speech at the CBI annual conference 2016, 21 November 2016: <https://www.gov.uk/government/speeches/cbi-annual-conference-2016-prime-ministers-speech> [accessed 7 December 2016]

29 HM Treasury, *Autumn Statement 2016* (23 November 2016): <https://www.gov.uk/government/publications/autumn-statement-2016-documents/autumn-statement-2016> [accessed 7 December 2016]

30 Written evidence from the British Council (EUF0012)

31 Written evidence from the Campaign for Science and Engineering (CaSE) (EUF0005)

32 Science and Technology Committee, *EU membership and UK science* (2nd Report, Session 2015–16, HL Paper 127), para 225

research consortia or being omitted from new consortia.³³ Jo Johnson MP sought to reassure the research community in his speech at the Wellcome Trust on 30 June: “It is business as usual for Horizon 2020. I would be concerned about any discrimination against UK participants and am in close touch with Commissioner Moedas on these issues.”³⁴

32. The European Commissioner for Research, Science and Innovation, Carlos Moedas, also sought to reassure UK researchers, stating that for the time being there would be no change in their eligibility for Horizon 2020 funding. However, he also stated that it was too early to speculate on what the implications of the UK actually leaving the EU would be.³⁵
33. On 13 July, Jo Johnson MP announced that the Department for Business, Innovation and Skills (now the Department for Business, Energy and Industrial Strategy (BEIS)) had set up a unit and a specific email address³⁶ to receive evidence of any discrimination against the participation of UK institutions in Horizon 2020.³⁷
34. On 26 July, Professor Sir Venki Ramakrishnan, President of the Royal Society, was quoted saying that he had seen no evidence that European funding bodies were discriminating against British research projects as a result of the vote to leave.³⁸ This was contrary to reports from others. For example, in oral evidence to the House of Commons Science and Technology Select Committee on 13 July, Professor Nelson said:

“I have heard multiple stories of some quite unpleasant things happening, with UK researchers being asked to leave consortia. They are all anecdotal at this stage, but they are multiple. Probably six different vice-chancellors have told me different stories about different consortia that are taking negative attitudes to the inclusion of UK researchers.”³⁹

35. Jo Johnson MP told us on 25 October that the email system the Government had set up to gather evidence of any funding discrimination had so far received 132 emails:

“The bulk—about two-thirds—of submissions we had to the email system we set up related to those funding issues. We feel we have addressed roughly two-thirds of those. The remaining third of the 132 emails we had dealt broadly with the uncertainty people felt about their status in the country and whether they could continue to stay and what

33 See for example: ‘UK scientists dropped from EU projects because of post-Brexit funding fears’, *The Guardian* (12 July 2016): <https://www.theguardian.com/education/2016/jul/12/uk-scientists-dropped-from-eu-projects-because-of-post-brexit-funding-fears> [accessed 9 November 2016]; ‘It’s not “business as usual” until Brexit. UK scientists are already feeling the effects’, *The Guardian* (12 July 2016): <https://www.theguardian.com/education/2016/jul/12/its-not-business-as-usual-until-brexit-uk-scientists-are-already-feeling-the-effects> [accessed 9 November 2016]

34 ‘European commissioner Carlos Moedas reassures UK researchers post-Brexit’, *Times Higher Education* (1 July 2016): <https://www.timeshighereducation.com/blog/european-commissioner-carlos-moedas-reassures-uk-researchers-post-brexit> [accessed 9 November 2016]

35 *Ibid.*

36 This email address is: research@bis.gsi.gov.uk

37 Oral evidence taken before the House of Commons Science and Technology Committee, 13 July (Session 2016–17), [Q 120](#) (Jo Johnson MP)

38 ‘No evidence of Brexit ‘penalties’ for science, says Royal Society president’, *The Telegraph* (26 July 2016): <http://www.telegraph.co.uk/news/2016/07/26/no-evidence-of-brexit-penalties-for-science-says-royal-society-p/> [accessed 9 November 2016]

39 Oral evidence taken before the House of Commons Science and Technology Committee, 13 July 2016 (Session 2016–17), [Q 94](#) (Prof Philip Nelson)

sort of welcome they would have if they were to choose to do so. ... We have not had hard, concrete evidence of actual discrimination, as with previous witnesses before your Committee.”⁴⁰

36. Mr Gareth Davies, Director General of Business and Science at BEIS, told us that the Government was using the Horizon 2020 national contact network to try to get qualitative data about what is happening, and that, “It would not be a surprise if applications dipped in the immediate days after the referendum but since then we have seen the rate of referrals go back to pre-referendum levels.”⁴¹ We also heard from Mr Ron Mobed, Chief Executive Officer of Elsevier about work being done by Elsevier to gather data on the impact of Brexit.⁴²
37. Ms Sharon Witherspoon, Policy Chief at the Academy of Social Sciences, emphasised that the Government should monitor the impact of the EU referendum on funding applications:
- “Up-to-date monitoring of applications going in, success rates, the proportion of cases where UK institutions are hosts and so on should be in place now. Our view is that it needs to be done in an official way through BEIS perhaps and collaboration with Universities UK, and I am sure organisations such as Elsevier, so that we are getting monthly or quarterly figures. ... it is absolutely important that those figures are fed into the Brexit negotiations on a continuing basis with a strong voice.”⁴³
38. **We note that the Government continues to seek hard evidence of discrimination against UK researchers in EU funding or collaboration. While there appears so far to be a scarcity of hard evidence, there is a clear perception in the scientific community that discrimination is occurring, perhaps in ways that will never be documented explicitly. This reinforces the importance of early and repeated reassurances from the Government on funding arrangements.**
39. *We recommend that the Government should publish in anonymised, aggregate form any evidence received of discrimination against UK researchers in EU funding or collaboration, along with its own assessment of whether the concerns put forward have been addressed by subsequent reassurances or other policy interventions.*

40 [Q 48](#) (Jo Johnson MP)

41 [Q 48](#) (Mr Gareth Davies)

42 [Q 19](#) (Mr Ron Mobed)

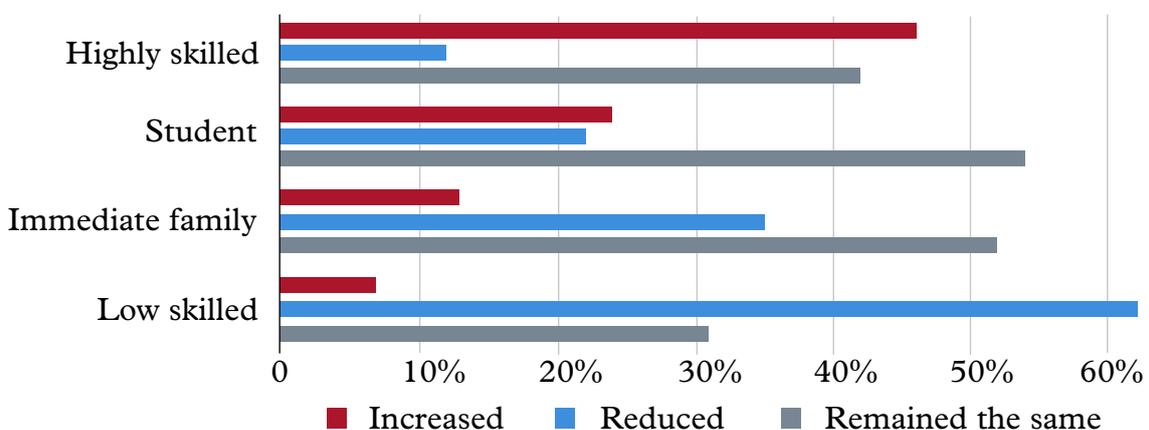
43 [Q 13](#) (Ms Sharon Witherspoon)

CHAPTER 3: PEOPLE

Freedom of movement

40. Within the EU, workers benefit from freedom of movement, allowing them to reside and work freely within the territory of any Member State. It is a central tenet of the EU that there must be no discrimination based on nationality between workers of the Member States as regards employment, remuneration and other conditions of work and employment.
41. The subject of immigration into the UK was one of the major battlegrounds in the run up to the EU referendum and it seems likely that it will be a major component of the Brexit negotiations. Switzerland's recent change in its immigration rules put that country at a substantial disadvantage in the scientific world.⁴⁴
42. The report by British Future, *What Next After Brexit?*⁴⁵ examined immigration and integration in the UK after the EU referendum. It commissioned research by ICM after the EU referendum which found that the public's views on immigration were more nuanced than might first be thought. Figures 4 and 5 below show the results of this research in which people were asked about their attitudes to different categories of migrant to Britain.
43. This research showed that only 12% of people, for instance, would like to see a reduction in the numbers of highly skilled workers coming to Britain; nearly four times as many people (46%) would like to see more of it, with 42% saying that it should stay the same (see Figure 4).

Figure 4: Immigration attitudes by types of migrant

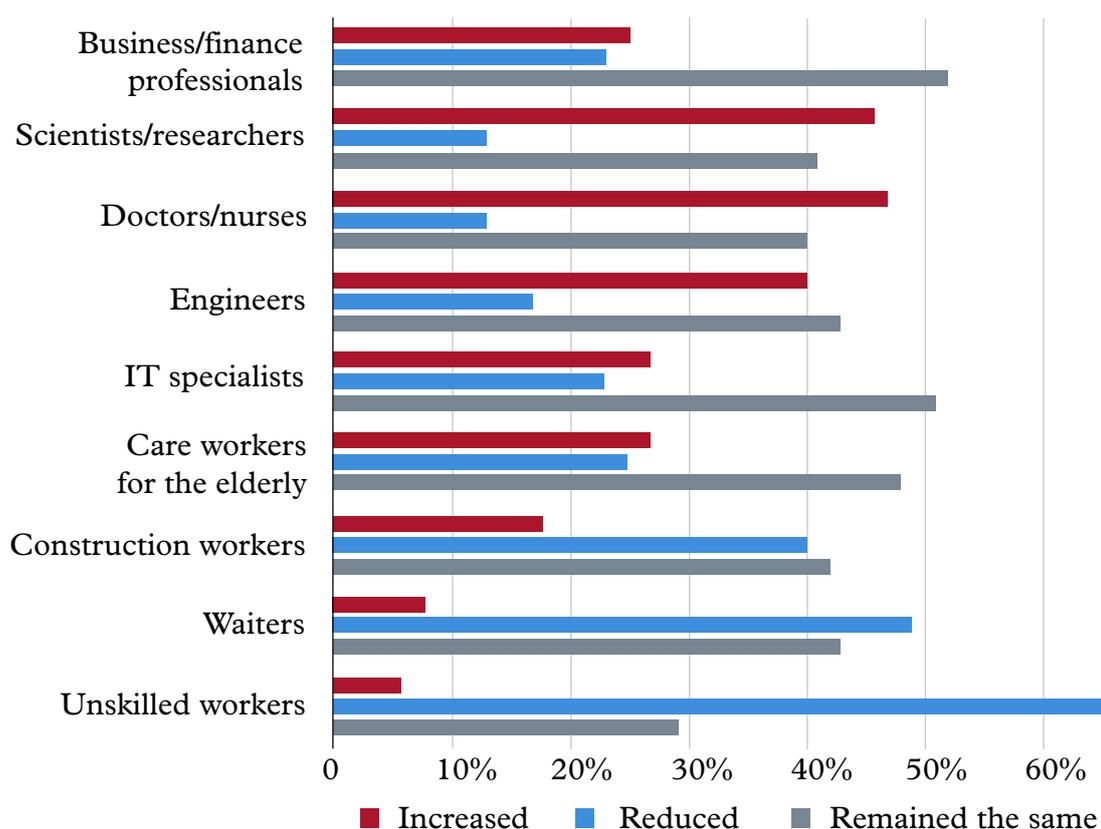


Source: British Future, *What next after Brexit? Immigration and integration in post-referendum Britain* (August 2016), p 11: <http://www.britishfuture.org/wp-content/uploads/2016/09/What-next-after-Brexit.pdf> [accessed 23 November 2016]

44. The same report also found that only 13% of people would like to see a reduction in the number of scientists or researchers coming to Britain. 46% would like to see this increased and 41% said it should stay the same (see Figure 5).

44 Science and Technology Committee, *EU membership and UK science* (2nd Report, Session 2015–16, HL Paper 127), para 244

45 British Future, *What next after Brexit? Immigration and integration in post-referendum Britain* (August 2016): <http://www.britishfuture.org/wp-content/uploads/2016/09/What-next-after-Brexit.pdf> [accessed 23 November 2016]

Figure 5: Immigration attitudes by migrant profession

Source: *British Future, What next after Brexit? Immigration and integration in post-referendum Britain* (August 2016), p 12

45. The EU referendum has resulted in uncertainty for EU researchers in the UK as well as UK researchers in the EU. The Government has sent encouraging but imprecise signals, and has not made unequivocal commitments to EU nationals pursuing research careers in the UK. Similarly, as far as we are aware, the EU has not made unequivocal commitments to UK nationals pursuing research in other parts of the EU.
46. The written evidence we received from the British Council and the Scientists for EU Campaign provided anecdotal but undocumented examples of scientists and students making decisions to leave or not to come to the UK because of the result of the EU referendum.⁴⁶ On 19 July, Professor Alex Halliday, Vice-President and Physical Sciences Secretary of the Royal Society, told us that, “people are deciding not to come to the UK right now, and they are saying that they are not going to become a professor at such-and-such university—and we have growing evidence for this—because of what has just happened.”⁴⁷
47. However, on 23 September, Professor Sir David Greenaway, Chair of the Russell Group, and Vice-Chancellor of the University of Nottingham, told us that he knew of only one case of an EU academic deciding not to come to the UK and citing the EU referendum result as one factor in this.⁴⁸ Professor David Phoenix OBE, Chair of MillionPlus, and Vice-Chancellor of London South Bank University, was similarly aware of only

46 Written evidence from the British Council ([EUF0012](#)) and Scientists for EU Campaign ([EUF0011](#))

47 [Q 6](#) (Prof Alex Halliday)

48 [Q 22](#) (Prof Sir David Greenaway)

one such incident. He said there was “a danger in the discussion around ... the exchange of staff where we talk ourselves into a position or let the media push us into a position without having a strong evidence base, because there are one or two examples around the sector, but not enough to be clear on”.⁴⁹ Similarly, Dr Patrick Vallance, President of Pharmaceuticals R&D at GlaxoSmithKline (GSK), told us that, “About 10% to 15% of our UK-based workforce are EU nationals. It is less of an issue for us and we certainly have not had any concerns expressed about what happens afterwards.”⁵⁰ Jo Johnson MP said:

“In all my meetings with stakeholders I always ask them for any evidence of greater than usual churn of academics or talented people of one sort of other leaving the UK at a greater than normal rate or of fewer applications coming in than they might usually expect. I am keen to get any evidence of this sort of exceptional kind of churn that might be linked to the referendum, but I have not yet been provided with any.”⁵¹

48. Lord Stern of Brentford, President of the British Academy and IG Patel Professor of Economics and Government at the London School of Economics, whilst accepting that most of the current evidence was anecdotal, highlighted the importance of monitoring the flow of researchers between the UK and the EU: “You do not wait until the whole story has played its way through before deciding that the evidence is that this risk is strong. You have to act early on that and guaranteeing the position of those already here is not only the right thing to do morally, from my point of view, because we have given promises in the past, but economically.”⁵²
49. There are similarities between the effect of uncertainties on funding as described in Chapter 2, and those on people as described in this Chapter. In both cases, hard, documented evidence is currently scarce but confidence in the scientific community continues to be undermined.
50. **We recognise that at this early stage, there is little documented evidence of scientists from other EU Member States deciding not to come to the UK because of the EU referendum, or of UK scientists deciding not to work in other EU Member States for that reason. But nervousness about immigration and nationality persists in the science community. The delay in solid reassurances and mixed messages from senior ministers is having a corrosive effect on the UK research base.**
51. *It is essential that a robust evidence base is assembled to ensure that any necessary remedial action can be taken at the earliest possible stage. The Government and the wider science community should search in the short and medium terms for any early indications of change in the attractiveness of the UK to talented scientists.*

Retaining talent

52. The evidence we received documented a strong preference in the science world to retain free movement of scientists within the EU. The Publishers Association told us that, “Ensuring free movement of staff and students

49 [Q 22](#) (Prof David Phoenix OBE)

50 [Q 25](#) (Dr Patrick Vallance)

51 [Q 48](#) (Jo Johnson MP)

52 [Q 2](#) (Lord Stern of Brentford)

between higher education institutions in the UK and EU is important. Restrictions would also make it difficult for universities to attract world class researchers and international students which would hamper the UK's position as a leader in this field.”⁵³ Cancer Research UK said that the existing free movement rules, including the right to bring partners and dependents, enabled the recruitment of talented researchers “easily and cost-effectively”.⁵⁴

53. Many witnesses told us that the Government must provide clear and repeated messages to reassure current and potential students, EU citizens working in science, technology, engineering and mathematics (STEM) and the families of these workers, that they are of great value to the UK's science community and that they will be able to continue studying and working here after the UK has left the EU. Mr Phil Smith, Chairman of UK & Ireland at Cisco, told us, “we need to make sure that this short-term uncertainty does not force people to start thinking about other things. At the moment we need clarity and simplicity”.⁵⁵
54. The Government has made a number of announcements since the EU referendum. In a speech at the Wellcome Trust on 30 June, Jo Johnson MP stated:

“We remain fully open to scientists and researchers from across the EU. We hugely value the contribution of EU and international staff. And there are no immediate changes to their rights to live and work in the UK.”⁵⁶
55. This positive speech by the Minister contrasts with the widely publicised Conservative Party Conference speech by the Home Secretary, the Rt Hon Amber Rudd MP, who set out the means by which she would reduce net migration. She pledged to “look again at whether our immigration system provides the right incentives for businesses to invest in British workers”.⁵⁷ She also set out plans to consider whether student immigration rules should be tailored to the quality of the course and the quality of the educational institution.⁵⁸
56. Professor Sir Venki Ramakrishnan, President of the Royal Society, was reported to have called on the Government in July to issue a statement to reassure EU citizens that they will be able to continue working in the UK.⁵⁹ On 10 October, the Prime Minister said: “I expect to be able to guarantee the legal rights of EU nationals already in the UK, so long as the British

53 Written evidence from the Publishers Association ([EUF0013](#))

54 Written evidence from Cancer Research UK ([EUF0003](#))

55 [Q 44](#) (Phil Smith)

56 Jo Johnson MP, Speech on leading the world in the new age of global science, 30 June 2016: <https://www.gov.uk/government/speeches/leading-the-world-in-the-new-age-of-global-science> [accessed 8 November 2016]

57 Amber Rudd, Speech at the Conservative Party Conference 2016, 4 October 2016: <http://press.conservatives.com/post/151334637685/rudd-speech-to-conservative-party-conference-2016> [accessed 14 November 2016]

58 *Ibid.*

59 ‘No evidence of Brexit ‘penalties’ for science, says Royal Society president’, *The Telegraph* (26 July 2016): <http://www.telegraph.co.uk/news/2016/07/26/no-evidence-of-brex-it-penalties-for-science-says-royal-society-p/> [accessed 8 November 2016]

nationals living in Europe—countries who are member states—receive the same treatment.”⁶⁰

57. We pressed Jo Johnson MP on when the Government would give further reassurances to EU nationals wanting to work or study in STEM subjects in the UK. He told us:

“It is important that we have an ability to attract the brightest and best ... We completely agree with you on the need to send out a positive message in that respect ... [T]hese are decisions which have to be sequenced very carefully in the context of the broader national interest at stake in the whole of the negotiation. We understand that science is global, that there are huge benefits from our ability to bring in brilliant scientists, technicians, and so on, to work in this country, and we want that to continue.”⁶¹

58. *We welcome Jo Johnson MP’s reassurance but we find the Home Secretary’s attitude towards student immigration less than helpful. We reiterate the recommendations we made in our 2014 report, International STEM students that:*

- *the Government should distinguish in the immigration statistics and the net migration target between students—holding Tier 4 visas—and other immigrants; and*
- *the Government should treat student numbers separately for immigration policy making purposes.*

59. *In the light of the EU referendum, the need for Government action on this issue is all the more pressing and the Home Secretary’s speech deeply worrying. Whilst recognising that immigration is a highly politically charged issue, we would remind the Government that the public’s views on immigration are more nuanced than newspaper headlines might suggest. We urge the Government in the strongest possible terms to take action.*

60. *In the short term the Government should send repeated signals to the global science community that the UK remains a welcoming place for talented scientists.*

61. *We recommend that the Government, through its global science and innovation network, or the British Council, should perform annual surveys around the world assessing the UK’s reputation in the global scientific community as a welcoming place to pursue a scientific career. The results of these surveys should be published.*

Attracting talent

62. The importance to the UK of attracting and retaining talented researchers and workers in the field of science was emphasised by many of our witnesses.
63. Professor Dame Jocelyn Bell Burnell, President of the Royal Society of Edinburgh, told us that, “The UK has been successful in science and

60 ‘David Davis warns EU leaders not to go ahead with ‘punishment plan’ for Britain’, *The Telegraph* (10 October 2016): <http://www.telegraph.co.uk/news/2016/10/10/theresa-may-brexit-talks-denmark-netherlands-live/> [accessed 8 November 2016]

61 [Q 50](#) (Jo Johnson MP)

innovation because it attracts excellent talent from overseas.”⁶² The British Council told us the UK needs to remain innovative to be globally competitive and “that requires drawing on global rather than just national talent and resources”.⁶³

64. The Minister agreed that it was important for the UK to attract the brightest and best in the field of science and that, “Our ability to be part of this global market for the most highly talented is a crucial part of our ability to continue to generate the extraordinary returns we see on our science expenditure.”⁶⁴
65. *The EU referendum result and mixed messages from the Government may well undermine the shared ambitions of the Government and the research community to welcome talented scientists to the UK. We therefore recommend that the Government should take decisive steps to promote the UK as a first class location for research careers and an attractive partner for international collaboration. Some components of this global initiative are already in place and need only be enhanced in scale and emphasis. Actions the Government might take which we have identified in the course of our private deliberations include:*
- *maintaining the Chevening scholarships that attract talented, highly motivated people to pursue post-graduate studies in the UK;*
 - *creating additional scholarships for the most talented early career researchers at PhD and postdoctoral levels—regardless of whether they come from the UK or other countries—to nurture the next generation of research leaders in the UK; and*
 - *expanding the Research Councils’ Global Challenges Fund and the Newton Fund to make available additional resources for international research collaborations, but not at the expense of domestic investment in science and research.*
66. *The expansion of these programmes should be subject to the rigorous review and value for money appraisals that apply to existing research funding.*
67. *But the expansion of existing programmes is not enough. At the highest levels in the world of science, it is not sufficient for the UK just to permit the world’s most accomplished scientists to work in the UK. The UK must search for these scientists and persuade them to pursue careers here. These scientific leaders may well be magnets for investment by international businesses and not for profit organisations.*
68. *The evidence we received set out many of the challenges facing UK science after the EU referendum. In the following paragraph we outline a scheme to attract outstanding scientific leaders to the UK which we would ask the Government to consider. The scheme draws upon our collective experience of science, business and academia, and we believe that it would help both to tackle the challenges*

62 [Q 2](#) (Prof Dame Jocelyn Bell Burnell)

63 Written evidence from the British Council ([EUF0012](#))

64 [Q 50](#) (Jo Johnson MP)

identified in the evidence and to make progress towards the desired end point of UK science flourishing post-Brexit.

69. *We recommend that the Government asks National Academies and the new UKRI to search the globe for outstanding scientific leaders, and attract them to the UK with compelling offers of research funding for their first 10 years in the UK and support for their immediate families as they settle into the UK. This initiative should receive resources beyond the existing science and research budget to ensure that it does not undermine support for the existing UK science community.*

CHAPTER 4: FACILITIES, RESEARCH INFRASTRUCTURE AND REGULATION

Facilities and research infrastructure

70. The arrangements for funding and participation in European research infrastructure (RIs) are set out in pages 52–58 of the Committee’s *EU membership and UK science* report.⁶⁵ EU membership is not a requirement for participation in most shared European RIs. The European Commission facilitates, but does not fund, participation of EU Member States in shared European RIs through the European Strategic Forum on Research Infrastructures (ESFRI).
71. As we observed in our April report, “Wide access to many RIs is available to non-EU Member States as well as to countries outside Europe”.⁶⁶ EU membership may nonetheless play a role in decisions on where to locate facilities. In written evidence to the Committee’s *EU membership and UK science* inquiry, the European Bioinformatics Institute (EMBL-EBI) stated:
- “EMBL-EBI would not have been able to participate so fully, or even at all, in these infrastructure projects were the UK not an EU member, and EMBL-EBI’s selection as the hub for ELIXIR [European Life-science Infrastructure for Biological Information] would certainly have been in question were the UK not part of the EU.”⁶⁷
72. The UK Atomic Energy Authority’s written evidence (to our earlier inquiry) on the Joint European Torus (JET) nuclear fusion facility in Oxfordshire and its contribution to the larger ITER facility being built in France stated:
- “EU funding and collaboration is essential to sustain the world leading capability of Culham and to position the UK in the technologies of the future fusion (and fission) economy.”⁶⁸
73. In a document setting out its priorities post-Brexit, the Russell Group said: “We are particularly concerned about the long-term future of the six Pan-European Research Infrastructures headquartered in the UK⁶⁹ which support numerous high quality jobs and represent an important part of the UK research capacity.”⁷⁰ Other major research establishments are also established in the UK including the European Space Agency and the European Centre for Medium-Range Weather Forecasts.
74. We put it to Jo Johnson MP that Brexit presents an opportunity for the UK to take bold actions to establish itself assertively in the global science

65 Science and Technology Committee, *EU membership and UK science* (2nd Report, Session 2015–16, HL Paper 127)

66 Science and Technology Committee, *EU membership and UK science* (2nd Report, Session 2015–16, HL Paper 127), para 177

67 Written evidence from the European Bioinformatics Institute (EMBL-EBI) ([EUM0038](#))

68 Written evidence from the UK Atomic Energy Authority ([EUM0024](#))

69 These are HIPER—High Power Laser Energy Research Facility (Harwell); ELIXIR—European Life-science Infrastructure for Biological Information (Hinxton); INSTRUCT—Integrated Structural Biology Infrastructure (Oxford); ISBE—Infrastructure for Systems Biology-Europe (Imperial College London); SKA—Square Kilometre Array (Manchester, Jodrell Bank); and ESS ERIC—European Social Survey (London, City University).

70 Nottingham University, *Russell Group priorities after Brexit* (4 July 2016): <https://www.nottingham.ac.uk/about/documents/eu/russell-group-briefing-eu-referendum-july-2016.pdf> [accessed 9 November 2016]

community, including UN agencies. We suggested that the UK might, for example, host a major new international research facility to demonstrate to the international science community that the UK is one of the most attractive places in the world to pursue a scientific career and to invest in top quality science.

75. In reply, the Minister told us that Brexit:

“... gives us an opportunity to ... position ourselves for the future as a country that is determined to stay at the cutting edge of science. We are already host to a number of important research facilities and we are continuing to develop our networks ... We continue to analyse all the opportunities to make more such commitments when they present good value for money.”⁷¹

76. ***We urge the Government to consult the science community in the short- and medium-term to identify opportunities for bold long-term moves to reinforce the UK’s global standing in science. This could include the UK offering to host, in partnership with governments and funding bodies from other countries, one or more new international research facilities on the scale of the Diamond Light Source⁷² in Harwell or the Francis Crick Institute⁷³ in London, together with existing and new networks. We expect that all such moves should be subject to the rigorous review and value for money appraisals that apply to existing research funding.***

Expanding international collaboration

77. We cannot, at this stage, anticipate the outcome of Brexit negotiations on science. Against that background, UK scientific leaders should try not to be consumed entirely with UK-EU negotiations and should make space for discussions with the rest of the world—particularly where there is potential to build on an existing track record. The UK-US axis on science stands out as an opportunity worth exploring.

78. Professor Steven Cowley, President of Corpus Christi College, Oxford, told us:

“2017 is an opportune time on both sides of the Atlantic to grow and enhance the formal science and technological links between the UK and the US. Informal connections are already strong. ... However, compared to the current UK-EU axis, there are few formal UK-US collaborative research programmes or joint research institutes.

Given the success of EU collaborative research programmes and institutes, it is clear such research structures are effective. It would thus be prudent to explore the possibility of UK-US joint programmes and institutes.”⁷⁴

79. ***The Government is already making clear efforts to build trade relationships around the world: it should pursue similar activities in the scientific domain, exploring collaborations and shared protocols***

71 Q 45 (Jo Johnson MP)

72 Diamond Light Source: <http://www.diamond.ac.uk/Home.html>

73 The Francis Crick Institute: <https://www.crick.ac.uk/>

74 Written evidence from Prof Steven Cowley (EUF0019)

with Governments and funding agencies in major scientific nations, particularly where existing relationships are already strong.

Regulation

80. Several regulatory issues were addressed in our April report. Whilst we did not mention regulation in the document launching this follow up investigation, we received helpful evidence on important regulatory topics. A full assessment of the regulatory dimension of Brexit is beyond the scope of this follow-on inquiry, but we highlight specific points from the evidence we received.

The Great Repeal Bill

81. On 2 October, in a speech to the Conservative Party Conference, the Prime Minister announced that the Government would introduce a Great Repeal Bill.⁷⁵ The aim of that legislation will be to end the authority of EU law by converting all its provisions into British law. It will also repeal the 1972 European Communities Act, which gives primacy and direct effect to all EU law.⁷⁶

Is there a scientific dimension to the Great Repeal Bill?

82. The UK's withdrawal from the EU offers an opportunity to review existing regulation. It may be determined that certain aspects of EU regulation are inappropriate post-Brexit, or that in specific cases the benefits to R&D of UK regulations, tailored to this country's own needs, would outweigh the disadvantage of losing regulatory harmonisation under EU arrangements.
83. Most submissions called for the generality of UK regulations in the scientific domain to remain harmonised with those of the EU after Brexit. Dr Vallance said "simple harmonised regulation is important for us, so having to make multiple different regulatory submissions adds a burden and adds complexity, so in general we look for harmonisation and, therefore, a retreat from that, if that is what happens with the EU, would be undesirable".⁷⁷ Cancer Research UK made the point that, "UK standards and legislation governing the approval and conduct of research must be compatible with the EU to enable our continued participation in pan-EU research projects."⁷⁸
84. However, whilst stressing that leaving the EU presents complex challenges for the future of regulation, standards and legislation, CaSE said that:
- "This is also an area where leaving the EU could provide real opportunities to create a distinctive, attractive environment for research and innovation in the UK. However, this is balanced by the need to first and foremost ensure continued alignment and compatibility with EU regulatory frameworks to support cross-border collaboration, participation in programmes and trade."⁷⁹

75 'Brexit: Theresa May to trigger Article 50 by end of March', *BBC News* (2 October 2016): <http://www.bbc.co.uk/news/uk-politics-37532364> [accessed 9 November 2016]

76 'Theresa May's 'great repeal bill': what's going to happen and when?', *The Guardian* (2 October 2016): <https://www.theguardian.com/politics/2016/oct/02/theresa-may-great-repeal-bill-eu-british-law> [accessed 9 November 2016]

77 Q 21 (Dr Patrick Vallance)

78 Written evidence from Cancer Research UK (EUF0003)

79 Written evidence from the Campaign for Science and Engineering (CaSE) (EUF0005)

85. CaSE also suggested that, “Leaving the EU could provide an opportunity for the UK to become a regulatory ‘sandbox’; a place for trying new approaches.”⁸⁰

86. Professor Burnell told us that Brexit offered a possible opportunity to simplify regulation:

“If we wish to trade with Europe we are going to have to largely abide by the European regulatory system, but if some of that proved too onerous—and perhaps the GMO regulation in Europe is a bit ponderous—we could say, “Stuff that”, and trade in GMOs with elsewhere in the world. We might be able to opt out of some of the regulatory stuff if we are more independent.”⁸¹

87. Mr James Lawford Davies, solicitor and partner at Hempsons, pointed to the cost and complexity of administering distinctive UK regulatory arrangements for our life science sector if the UK diverges from EU standards because:

“... much of the regulatory landscape is constantly changing and evolving in light of new developments in science and medicine ... Unless the UK agrees to maintain continuity and involvement with existing and forthcoming EU processes and systems, it will have to establish its own infrastructures to mirror those of the EU, creating a significant burden and expense with no additional benefit to the UK. An active and proactive form of regulatory cooperation between the UK and EU is therefore vital”⁸²

88. **It is unlikely that the concerns relating to the cost and complexity of administering distinctive UK regulatory arrangements for the life science sector if the UK diverges from EU standards identified by Mr Lawford Davies are confined to the medical and life sciences. We are unaware of any analysis of the costs and benefits within the science domain of any regulatory reforms which may appear as a consequence of the Great Repeal Bill.**

89. *We recommend that the Government should assess in the short term the administrative structures and scientific advice required to support the regulatory responsibilities in the scientific domain that will transfer from the EU to the UK following the Great Repeal Bill. That assessment should include, but not be limited to, the scientific dimensions of medical, agricultural, energy, environmental, transport and telecommunications regulation.*

90. *We urge the Minister to publish the results of this assessment before the Great Repeal Bill is enacted.*

Scientific advice during the Brexit process

91. CaSE told us that “appropriate structures and processes should be put in place by the UK government and parliament to ensure scientific and technical expertise and advice is appropriately accessed throughout the [Brexit] process”.⁸³ Professor John Womersley, then Chief Executive of the Science and Technology Facilities Council (STFC) and Chair of the ESFRI,

80 Written evidence from the Campaign for Science and Engineering (CaSE) ([EUF0005](#))

81 [Q 2](#) (Prof Dame Jocelyn Bell Burnell)

82 Written evidence from Mr James Lawford Davies ([EUF0017](#))

83 Written evidence from the Campaign for Science and Engineering (CaSE) ([EUF0005](#))

said that within BEIS great effort must be devoted to “understanding some of the legal issues around the future position of science and innovation in a post-Brexit world, and making sure those are fed into the Departments for Exiting the EU, for International Trade and so forth, wherever negotiations are led”.⁸⁴

92. We asked Jo Johnson MP whether scientific advice would be fed in during the course of the Brexit negotiations. He said that he was working closely with colleagues across Government to ensure that “the science and research community’s voice and interests are properly represented in the Government’s overview and understanding of where our national interest lies in these negotiations”.⁸⁵ He also confirmed that the network of chief scientists across the various departments, led by Sir Mark Walport, were “providing very helpful input into this process”.⁸⁶
93. ***The Government must ensure that it has appropriate scientific advice during the Brexit negotiations. We share the disappointment voiced by the House of Commons Science and Technology Committee in its report *Leaving the EU: implications and opportunities for science and research*⁸⁷ that the Department for Exiting the European Union is not currently progressing with appointing a departmental Chief Scientific Adviser (CSA).***
94. ***The voice of the scientific community should be heard alongside the voice of business during the Brexit negotiations and in making future alliances. We urge the Government in the short term to assess the need for a Chief Scientific Adviser in the Department for International Trade, bearing in mind the scale of scientific analysis that underpins international trade regulations and may be required for trade negotiations.***

84 [Q 39](#) (Prof John Womersley)

85 [Q 52](#) (Jo Johnson MP)

86 [Q 53](#) (Jo Johnson MP)

87 House of Commons Science and Technology Committee, *Leaving the EU: implications and opportunities for science and research* (Seventh Report, Session 2016–17, HC 502)

CHAPTER 5: POTENTIAL OPPORTUNITIES OFFERED BY BREXIT

95. The disadvantages of Brexit received much attention during the period immediately after the EU referendum. Deep concerns about Brexit remain but, more recently, they have been accompanied by speculation about potential benefits available to the UK outside the EU. In this Chapter we consider early evidence and suggestions of opportunities which Brexit may offer science in the UK in the areas of the Industrial Strategy and the possible reform of VAT rules for facilities shared by science and business. We received a small amount of evidence about the potential opportunity that may be offered by the reform of the state aid rules but we do not have a sufficiently wide evidence base to consider that issue in this report.

The Industrial Strategy

96. On 18 July, the Prime Minister announced the formation of the BEIS. This resulted from a merger of the functions of the Department of Business, Innovation and Skills (BIS) and the Department for Energy and Climate Change (DECC). The Rt Hon Greg Clarke MP was appointed Secretary of State for BEIS. In a speech at the Royal Society on 1 August, he stated that his ministerial team would work:

“... closely together to develop and put in practice our Industrial Strategy. When I met the Prime Minister it was clear that this was her personal vision. It’s an important moment when we have explicit recognition that the government should deliberately take a strategic approach to business and the economy”.⁸⁸

97. Brexit is a major part of the context in which the Industrial Strategy is being developed. Early statements from ministers suggest that the Industrial Strategy will define much of the future relationship between the Government and business, within a wider policy framework for the economy and public spending.
98. In oral evidence Jo Johnson MP told us that the Government was in the process of gathering evidence for the Industrial Strategy from stakeholders. A discussion paper would be published around the time of the Autumn Statement, and “a more considered response from the Government [would be produced] in the new year of 2017”.⁸⁹
99. He told us that an Industrial Strategy:
- “... has to be about making sure we have the skills base, the capacity to absorb research and innovation; it has to be about having the hard and soft infrastructure ... as well as the education and healthcare systems, and it has to be about science and innovation, so making sure ... that we have a world-class research base that will keep us at the cutting edge of discovery for years to come ... We also have to ensure that we are continuing to create a business environment that will be attractive to

88 Rt Hon Greg Clark MP, Speech on new ministerial team to develop industrial strategy, 1 August 2016: <https://www.gov.uk/government/speeches/new-ministerial-team-to-develop-industrial-strategy> [accessed 14 November 2016]

89 Q 47 (Jo Johnson MP)

inward investment and that will enable us to have competitive companies creating jobs and opportunities”.⁹⁰

100. In the Chancellor of the Exchequer’s Autumn Statement⁹¹ on 23 November, he confirmed an additional £2 billion per year by 2020 for R&D. This funding will be channelled through UKRI. He said the new Industrial Strategy Challenge Fund would be, “a new cross-disciplinary fund to support collaborations between business and the UK’s science base, which will set identifiable challenges for UK researchers to tackle”.⁹² The Prime Minister told the CBI that this fund would, “direct some of that investment to scientific research and the development of a number of priority technologies in particular, helping to address Britain’s historic weakness on commercialisation and turning our world-leading research into long-term success”.⁹³ She also pledged to build on the work done to make “the Research and Development Credit more generous and easier to use” by looking at how to make this support even more effective with the aim of ensuring, “a tax system that is profoundly pro-innovation”.⁹⁴
101. Professor Womersley explained the importance of the Industrial Strategy and the priorities it should have in the light of the EU referendum:
- “It allows us to explain the role of science and innovation in underpinning future productivity growth in a knowledge-based economy. It allows us to talk about the skills, about basic technology and how to feed them through into economic activity, not just in a linear system but to feed back challenges. It enables us to make this connection between the work of the research councils, the work of universities, the work of Innovate [UK] and others and other PSREs [public sector research establishments] as well, in a way which obviously relates to government priorities and which might influence negotiation strategy around Brexit and even future funding.”⁹⁵
102. Similarly, Professor Dame Julia Slingo, Chief Scientist at the Met Office, told us, “The formation of the department in which you bring together business, energy and Industrial Strategy alongside the research base is also a very good signal of our intent on where we as a country want to go ... There are some real opportunities here which we have not had in the past that are very timely.”⁹⁶
103. Jo Johnson MP told us that “the Government want to create a framework in which businesses can compete on level playing fields; they do not want necessarily to get into the world of persistent subsidies for individual companies or individual sectors”.⁹⁷ We recognise that outside the EU, and possibly outside the single market and the state aids regime, the UK will wish

90 [Q 47](#) (Jo Johnson MP)

91 HM Treasury, *Autumn Statement 2016* (23 November 2016): <https://www.gov.uk/government/publications/autumn-statement-2016-documents/autumn-statement-2016> [accessed 30 November 2016]

92 *Ibid.*

93 Prime Minister Theresa May, Speech at the CBI annual conference 2016, 21 November 2016: <https://www.gov.uk/government/speeches/cbi-annual-conference-2016-prime-ministers-speech> [accessed 7 December 2016]

94 *Ibid.*

95 [Q 38](#) (Prof John Womersley)

96 [Q 36](#) (Prof Dame Julia Slingo)

97 [Q 53](#) (Jo Johnson MP)

to conform to wider international regulations over the relationship between the Government and business.

104. **The development of an Industrial Strategy during the UK’s departure from the EU is a major opportunity for the Government to strengthen its support for UK science and increase its role in the economy. We welcome Jo Johnson MP’s expansive view of the scope of the Industrial Strategy and the alignment with the Industrial Strategy of the new funding announced by the Prime Minister on 21 November. We will follow the development of the Industrial Strategy with interest and may scrutinise it further in the short to medium term.**
105. **Within the framework of the Industrial Strategy and in view of this new funding, we hope that UKRI will be given the freedom to support projects on their merit, assessed by peer review. We also hope that UKRI will be free to use this funding to support international collaborations with partners in EU Member States and elsewhere if these provide the most attractive propositions.**
106. **Unless the negative effects of Brexit are mitigated, the UK will inevitably become a less attractive destination for talented people, research and development (R&D) investors and scientific partners. Fortunately, the Government has the power to mitigate many effects of Brexit and could use the Industrial Strategy and other interventions not only to compensate for Brexit, but to further increase the attractiveness of the UK as a place to pursue science careers and invest in R&D. This is a time for bold steps to prepare our country for life outside the constraints and opportunities of EU membership, but with a far more prominent place in the global economy.**
107. *In addition to the changes recommended in Chapters 2 and 3, the following mitigating changes could be made within the wider context of the Industrial Strategy:*
- *Reforming public procurement to support innovative businesses and otherwise stimulate the UK economy. Reforms should include, but not be limited to, enhancing the Small Business Research Initiative; and*
 - *Expanding the scale and scope of the R&D tax credit to cover a wider span of business innovation.*
108. **We welcome the Prime Minister’s commitment to review current R&D tax incentives and the announcement of a review of the Small Business Research Initiative.**

Reform of VAT rules for facilities shared by science and business

109. We heard evidence that exiting the EU provides the UK with an opportunity to promote research collaborations between academia and industry, and further attract inward investment. The extent to which charities and universities can currently partner with industry is limited by VAT rules on shared facilities, equipment and buildings. Cancer Research UK told us that “reform has not been possible because of EU membership”.⁹⁸ CaSE told us, “Publicly-funded research institutes are restricted to 5% commercial activity

98 Written evidence from Cancer Research UK ([EUF0003](#))

if they opt not to pay VAT or face costly tax bills to co-locate their researchers with industry colleagues”.⁹⁹ The Dowling Review¹⁰⁰ recommended that this be looked at as a matter of urgency.

110. Mr Davies explained that VAT exemption rules were part of the package of choices and trade-offs faced by the Government and that “officials [were] working through this process with colleagues in the Department for International Trade and the Department for Exiting the European Union ... spending our time now auditing the fact bases so that we can then make a clear assessment of the choices and trade-offs for Ministers”.¹⁰¹
111. ***The Government should take advantage of Brexit and review current rules on VAT exemption on sharing of buildings, equipment and facilities for the purposes of R&D, to support industry, academia and charity collaborations and attract further inward investment.***

99 Written evidence from the Campaign for Science and Engineering (CaSE) (EUF0005)

100 Department for Business, Innovation and Skills, *The Dowling Review of Business-University Research Collaborations*, (July 2015), recommendation 12: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/440927/bis_15_352_The_dowling_review_of_business-university_research_collaborations_2.pdf [accessed 7 December 2016]

101 [Q 53](#) (Mr Gareth Davies)

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

1. *The Government's commitment to underwrite Horizon 2020 funding with new money is significant and welcome. The Government should try to enable scientists in the UK to retain access to Horizon 2020 and other EU funding post-Brexit. In the light of the UK's science credentials and given that a number of countries outside the EU already have access to this funding, we would expect the EU and the UK Government to agree terms under which this access remains open. (Paragraph 25)*
2. We recognise this major increase in funding as a signal that the Government is putting significantly greater emphasis on science to deliver its long term objectives in addition to any replacement of EU funding. This is a highly encouraging development at a time when the future role of UK Research and Innovation (UKRI) is being considered during the passage of the Higher Education and Research Bill through Parliament. (Paragraph 28)
3. *Reassurances on funding are welcome but if they were to expire, and are not replaced, this would undermine some of the benefit of the major increase announced in the 2016 Autumn Statement. We assume the Government does not intend for this to happen, so we recommend that, in addition to the 2016 Autumn Statement announcement, the science and research budget should be re-based at an early opportunity to compensate fully for any reduction of funding from the EU, in effect adopting the Government's 13 August reassurances into the funding baseline for the science and research budget in future. (Paragraph 30)*
4. We note that the Government continues to seek hard evidence of discrimination against UK researchers in EU funding or collaboration. While there appears so far to be a scarcity of hard evidence, there is a clear perception in the scientific community that discrimination is occurring, perhaps in ways that will never be documented explicitly. This reinforces the importance of early and repeated reassurances from the Government on funding arrangements. (Paragraph 38)
5. *We recommend that the Government should publish in anonymised, aggregate form any evidence received of discrimination against UK researchers in EU funding or collaboration, along with its own assessment of whether the concerns put forward have been addressed by subsequent reassurances or other policy interventions. (Paragraph 39)*
6. We recognise that at this early stage, there is little documented evidence of scientists from other EU Member States deciding not to come to the UK because of the EU referendum, or of UK scientists deciding not to work in other EU Member States for that reason. But nervousness about immigration and nationality persists in the science community. The delay in solid reassurances and mixed messages from senior ministers is having a corrosive effect on the UK research base. (Paragraph 50)
7. *It is essential that a robust evidence base is assembled to ensure that any necessary remedial action can be taken at the earliest possible stage. The Government and the wider science community should search in the short and medium terms for any early indications of change in the attractiveness of the UK to talented scientists. (Paragraph 51)*
8. *We welcome Jo Johnson MP's reassurance but we find the Home Secretary's attitude towards student immigration less than helpful. We reiterate the recommendations we made in our 2014 report, International STEM students that:*

- *the Government should distinguish in the immigration statistics and the net migration target between students—holding Tier 4 visas—and other immigrants; and*
 - *the Government should treat student numbers separately for immigration policy making purposes. (Paragraph 58)*
9. *In the light of the EU referendum, the need for Government action on this issue is all the more pressing and the Home Secretary’s speech deeply worrying. Whilst recognising that immigration is a highly politically charged issue, we would remind the Government that the public’s views on immigration are more nuanced than newspaper headlines might suggest. We urge the Government in the strongest possible terms to take action. (Paragraph 59)*
 10. *In the short term the Government should send repeated signals to the global science community that the UK remains a welcoming place for talented scientists. (Paragraph 60)*
 11. *We recommend that the Government, through its global science and innovation network, or the British Council, should perform annual surveys around the world assessing the UK’s reputation in the global scientific community as a welcoming place to pursue a scientific career. The results of these surveys should be published. (Paragraph 61)*
 12. *The EU referendum result and mixed messages from the Government may well undermine the shared ambitions of the Government and the research community to welcome talented scientists to the UK. We therefore recommend that the Government should take decisive steps to promote the UK as a first class location for research careers and an attractive partner for international collaboration. Some components of this global initiative are already in place and need only be enhanced in scale and emphasis. Actions the Government might take which we have identified in the course of our private deliberations include:*
 - *maintaining the Chevening scholarships that attract talented, highly motivated people to pursue post-graduate studies in the UK;*
 - *creating additional scholarships for the most talented early career researchers at PhD and postdoctoral levels—regardless of whether they come from the UK or other countries—to nurture the next generation of research leaders in the UK; and*
 - *expanding the Research Councils’ Global Challenges Fund and the Newton Fund to make available additional resources for international research collaborations, but not at the expense of domestic investment in science and research. (Paragraph 65)*
 13. *The expansion of these programmes should be subject to the rigorous review and value for money appraisals that apply to existing research funding. (Paragraph 66)*
 14. *But the expansion of existing programmes is not enough. At the highest levels in the world of science, it is not sufficient for the UK just to permit the world’s most accomplished scientists to work in the UK. The UK must search for these scientists and persuade them to pursue careers here. These scientific leaders may well be magnets for investment by international businesses and not for profit organisations. (Paragraph 67)*

15. *The evidence we received set out many of the challenges facing UK science after the EU referendum. In the following paragraph we outline a scheme to attract outstanding scientific leaders to the UK which we would ask the Government to consider. The scheme draws upon our collective experience of science, business and academia, and we believe that it would help both to tackle the challenges identified in the evidence and to make progress towards the desired end point of UK science flourishing post-Brexit. (Paragraph 68)*
16. *We recommend that the Government asks National Academies and the new UKRI to search the globe for outstanding scientific leaders, and attract them to the UK with compelling offers of research funding for their first 10 years in the UK and support for their immediate families as they settle into the UK. This initiative should receive resources beyond the existing science and research budget to ensure that it does not undermine support for the existing UK science community. (Paragraph 69)*
17. *We urge the Government to consult the science community in the short- and medium-term to identify opportunities for bold long-term moves to reinforce the UK's global standing in science. This could include the UK offering to host, in partnership with governments and funding bodies from other countries, one or more new international research facilities on the scale of the Diamond Light Source in Harwell or the Francis Crick Institute in London, together with existing and new networks. We expect that all such moves should be subject to the rigorous review and value for money appraisals that apply to existing research funding. (Paragraph 76)*
18. *The Government is already making clear efforts to build trade relationships around the world: it should pursue similar activities in the scientific domain, exploring collaborations and shared protocols with Governments and funding agencies in major scientific nations, particularly where existing relationships are already strong. (Paragraph 79)*
19. *It is unlikely that the concerns relating to the cost and complexity of administering distinctive UK regulatory arrangements for the life science sector if the UK diverges from EU standards identified by Mr Lawford Davies are confined to the medical and life sciences. We are unaware of any analysis of the costs and benefits within the science domain of any regulatory reforms which may appear as a consequence of the Great Repeal Bill. (Paragraph 88)*
20. *We recommend that the Government should assess in the short term the administrative structures and scientific advice required to support the regulatory responsibilities in the scientific domain that will transfer from the EU to the UK following the Great Repeal Bill. That assessment should include, but not be limited to, the scientific dimensions of medical, agricultural, energy, environmental, transport and telecommunications regulation. (Paragraph 89)*
21. *We urge the Minister to publish the results of this assessment before the Great Repeal Bill is enacted. (Paragraph 90)*
22. *The Government must ensure that it has appropriate scientific advice during the Brexit negotiations. We share the disappointment voiced by the House of Commons Science and Technology Committee in its report *Leaving the EU: implications and opportunities for science and research* that the Department for Exiting the European Union is not currently progressing with appointing a departmental Chief Scientific Adviser (CSA). (Paragraph 93)*
23. *The voice of the scientific community should be heard alongside the voice of business during the Brexit negotiations and in making future alliances. We urge*

the Government in the short term to assess the need for a Chief Scientific Adviser in the Department for International Trade, bearing in mind the scale of scientific analysis that underpins international trade regulations and may be required for trade negotiations. (Paragraph 94)

24. The development of an Industrial Strategy during the UK's departure from the EU is a major opportunity for the Government to strengthen its support for UK science and increase its role in the economy. We welcome Jo Johnson MP's expansive view of the scope of the Industrial Strategy and the alignment with the Industrial Strategy of the new funding announced by the Prime Minister on 21 November. We will follow the development of the Industrial Strategy with interest and may scrutinise it further in the short to medium term. (Paragraph 104)
25. Within the framework of the Industrial Strategy and in view of this new funding, we hope that UKRI will be given the freedom to support projects on their merit, assessed by peer review. We also hope that UKRI will be free to use this funding to support international collaborations with partners in EU Member States and elsewhere if these provide the most attractive propositions. (Paragraph 105)
26. Unless the negative effects of Brexit are mitigated, the UK will inevitably become a less attractive destination for talented people, research and development (R&D) investors and scientific partners. Fortunately, the Government has the power to mitigate many effects of Brexit and could use the Industrial Strategy and other interventions not only to compensate for Brexit, but to further increase the attractiveness of the UK as a place to pursue science careers and invest in R&D. This is a time for bold steps to prepare our country for life outside the constraints and opportunities of EU membership, but with a far more prominent place in the global economy. (Paragraph 106)
27. *In addition to the changes recommended in Chapters 2 and 3, the following mitigating changes could be made within the wider context of the Industrial Strategy:*
 - *Reforming public procurement to support innovative businesses and otherwise stimulate the UK economy. Reforms should include, but not be limited to, enhancing the Small Business Research Initiative; and*
 - *Expanding the scale and scope of the R&D tax credit to cover a wider span of business innovation. (Paragraph 107)*
28. We welcome the Prime Minister's commitment to review current R&D tax incentives and the announcement of a review of the Small Business Research Initiative. (Paragraph 108)
29. *The Government should take advantage of Brexit and review current rules on VAT exemption on sharing of buildings, equipment and facilities for the purposes of R&D, to support industry, academia and charity collaborations and attract further inward investment. (Paragraph 111)*

APPENDIX 1: LIST OF MEMBERS AND DECLARATIONS OF INTEREST

Members

Lord Borwick
 Lord Cameron of Dillington
 Lord Fox
 Lord Hennessy of Nympsfield
 Lord Hunt of Chesterton
 Lord Mair
 Lord Maxton
 Baroness Morgan of Huyton
 Baroness Neville-Jones
 Lord Oxburgh
 Viscount Ridley
 Earl of Selborne (Chairman)
 Lord Vallance of Tummel
 Baroness Young of Old Scone

Declarations of interest

Lord Borwick
No relevant interests declared

Lord Cameron of Dillington
Farming interests in receipt of single farm payment
Trustee, Rothamsted
Chair of Advisory Council of Centre for Ecology and Hydrology (CEH)
Chairman, Strategic Advisory Board of the Global Food Security Programme

Lord Fox
Employed by and has financial interest in GKN PLC which participates in publically funded research and development

Lord Hennessy of Nympsfield
Fellow, British Academy
Atlee Professor of Contemporary British History, Queen Mary, University of London

Lord Hunt of Chesterton
Fellow, Royal Society
Director of Cambridge Environmental Research Consultants (CERC) Ltd (institution receives E.C. grants)
Member of Scientists for Europe
Emeritus Professor at University College London (institution receives E.C. grants)
Visiting Professor at University of Technology Delft and Toulouse University
Chairman, Advisory Committee of Tokamak Energy Ltd

Lord Mair
Fellow, Royal Academy of Engineering
Fellow, Royal Society
Sir Kirby Laing Professor of Civil Engineering, Cambridge University
Head, Cambridge Centre for Smart Infrastructure and Construction
Chair, Department of Transport's Science Advisory Council

Vice-President, Institution of Civil Engineers
Commissioner, Royal Commission for the Exhibition of 1851
Council Member, Foundation for Science and Technology

Lord Maxton

No relevant interests declared

Baroness Morgan of Huyton

Member of Council, King's College, University of London (institution receives EU funding)

Baroness Neville-Jones

Council Membership of the Engineering and Physical Sciences Research Council (EPSRC)

Member, Foundation for Science and Technology

Supporter, ConservativesIN

Lord Oxburgh

Fellow of the Royal Society

Honorary Fellow of various scientific and engineering academies in the UK and abroad.

Former Rector of Imperial College

Former Chairman of Shell Trading and Transport

Honorary Professor Cambridge University

Chairman of 2OC

Chairman of Green Energy Options

Viscount Ridley

Fellow, Academy of Medical Sciences

Vice-President, Conservatives for Britain

Hon. President, International Centre for Life, Newcastle

Ownership of a farm in receipt of EU funding

Earl of Selborne (Chairman)

Fellow, Royal Society

Fellow, Royal Society of Biology

Chairman, Foundation for Science and Technology

Supporter, ConservativesIN

Membership, Environmentalists for Europe (E4E)

Retired Director of an agricultural company

Lord Vallance of Tummel

Chairman, Royal Conservatoire of Scotland

Baroness Young of Old Scone

Chancellor of Cranfield University

Co-chairman of Environmentalists for Europe Chairman of the Woodland Trust Vice-president of Birdlife International and RSPB Patron, Institute of Ecological and Environmental Management

A full list of Members' interests can be found in the Register of Lords Interests: <http://www.parliament.uk/mps-lords-and-offices/standards-and-interests/register-of-lords-interests/>

Specialist Adviser

Professor Graeme Reid, Chair of Science and Research Policy, University College London

Professor of Science and Research Policy, University College London

Strategic Adviser to the National Centre for Universities and Business

Chairman of the Board of Directors, Campaign for Science and Engineering
Trustee, Association of Medical Research Charities
Associate Fellow, Centre for Science and Policy, University of Cambridge
Fellow, the Institute of Physics
Fellow, the Institution of Engineering and Technology

APPENDIX 2: LIST OF WITNESSES

Evidence is published online at www.parliament.uk/eu-membership-and-uk-science-follow-up and available for inspection at the Parliamentary Archives (020 7219 3074).

Evidence received by the Committee is listed below in chronological order of oral evidence session and in alphabetical order. Those witnesses marked with ** gave both oral evidence and written evidence. Those marked with * gave oral evidence and did not submit any written evidence. All other witnesses submitted written evidence only.

Oral evidence in chronological order

- | | | |
|----|--|---------------------------------|
| * | Professor Alex Halliday, Vice President, Physical Sciences Secretary, Royal Society | <u>QQ 1–10</u> |
| * | Lord Stern of Brentford, President, British Academy, IG Patel Professor of Economics and Government, London school of Economics | |
| * | Professor Dame Jocelyn Bell Burnell, President, the Royal Society of Edinburgh (RSE) | |
| * | Ms Sharon Witherspoon, Policy Chief, Academy of Social Sciences (AcSS) | <u>QQ 11–19</u> |
| * | Professor Philip Nelson, Chair, Research Councils UK (RCUK), Chief Executive, the Engineering and Physical Sciences Research Council (EPSRC) | |
| * | Mr Ron Mobed, Chief Executive Officer, Elsevier | |
| * | Professor Sir David Greenaway, Chair, the Russell Group, and Vice-Chancellor, University of Nottingham | <u>QQ 20–34</u> |
| ** | Professor David Phoenix OBE, Chair, MillionPlus, and Vice-Chancellor, London South Bank University | |
| * | Dr Patrick Vallance, President, Pharmaceuticals R&D, GlaxoSmithKline (GSK) | |
| * | Professor John Womersley, Chief Executive, Science and Technology Facilities Council (STFC) and Chair, European Strategy Forum on Research Infrastructures (ESFRI) | <u>QQ 35–44</u> |
| * | Mr Phil Smith, Chairman of UK & Ireland, Cisco | |
| ** | Professor Dame Julia Slingo OBE, Chief Scientist, Met Office | |
| * | Jo Johnson MP, Minister of State for Universities, Science, Research and Innovation, Department for Business, Energy and Industrial Strategy (BEIS) and Department for Education (DfE) | <u>QQ 45–56</u> |
| * | Mr Gareth Davies, Director General, Business and Science, Department for Business, Energy and Industrial Strategy (BEIS) | |

Alphabetical list of all witnesses

*	Academy of Social Sciences (AcSS) (QQ 11-19)	
	Alzheimer's Research UK and Alzheimer's Society	EUF0007
	Association of Innovation Research and Technology Organisations (AIRTO)	EUF0008
	Brightwake Ltd	EUF0016
*	British Academy (QQ 1-10)	
	British Council	EUF0012
	Campaign for Science and Engineering (CaSE)	EUF0005
	Cancer Research UK	EUF0003
*	Cisco (QQ 35-44)	
	Professor Steven C. Cowley FRS FEng, President, Corpus Christi College, University of Oxford	EUF0019
*	Department for Business, Energy and Industrial Strategy (BEIS) (QQ 45-56)	
*	Department for Education (DfE) (QQ 45-56)	
*	Elsevier (QQ 11-19)	
*	GlaxoSmithKline (GSK) (QQ 20-34)	
	James Hutton Institute	EUF0014
	KiWi Power	EUF0010
	Mr James Lawford Davies, Hempsons	EUF0017
**	Met Office (QQ 35-44)	EUF0015
**	MillionPlus (QQ 20-34)	EUF0002
	National Heritage Science Forum	EUF0001
	Publishers Association	EUF0013
*	Research Councils UK (RCUK) (QQ 11-19)	
	Royal College of Physicians	EUF0006
*	Royal Society (QQ 1-10)	
*	Royal Society of Edinburgh (RSE) (QQ 1-10)	
*	Russell Group (QQ 20-34)	
	The Science Council	EUF0004
*	Science and Technology Facilities Council (STFC) (QQ 35-44)	
	Scientists for EU Campaign	EUF0011
	techUK	EUF0009
	University of Warwick	EUF0018

APPENDIX 3: ABBREVIATIONS, ACRONYMS AND TECHNICAL TERMS

AIRTO	Association of Innovation Research and Technology Organisations
BEIS	Department for Business, Energy and Industrial Strategy
BIS	Department for Business, Innovation and Skills
Brexit	Refers to “British exit” from the EU: phrase is commonly used to include Northern Ireland
CaSE	Campaign for Science and Engineering
CBI	Confederation of British Industry
CSA	Chief Scientific Adviser
DECC	Department for Energy and Climate Change
EBI	European Bioinformatics Institute
EC	European Commission
ELIXIR	A pan-European research infrastructure for biological data
EMBL	European Molecular Biology Laboratory
ERA	European Research Area
ERC	European Research Council
ESFRI	European Strategy Forum on Research Infrastructures
ESIF	European Structural and Investment Funds
EPSRC	Engineering and Physical Sciences Research Council
ESS	European Social Survey
EU	European Union
FP	Framework Programme
FP7	Framework Programme 7
GM	Genetically modified
GMO	Genetically modified organism
GSK	GlaxoSmithKline
INSTRUCT	Integrated Structural Biology Infrastructure
ISBE	Infrastructure for Systems Biology-Europe
ITER	“The way” in Latin, an international experimental joint nuclear fusion reactor
JET	Joint European Torus
RCUK	Research Councils UK
R&D	Research and development
RI	Research infrastructure
RSE	Royal Society of Edinburgh

SKA	Square Kilometre Array
State aid	When state resources are used to provide assistance that gives organisations an advantage over others
STEM	Science, technology, engineering and mathematics
STFC	Science and Technology Facilities Council
UKRI	UK Research and Innovation
VAT	Value-added tax