HOUSE OF LORDS

Revised transcript of evidence taken before

The Select Committee on Science and Technology

Inquiry on

THE RELATIONSHIP BETWEEN EU MEMBERSHIP AND THE EFFECTIVENESS OF SCIENCE, RESEARCH AND INNOVATION IN THE UK

Evidence Session No. 14 *Heard in Public* *Questions 144 - 161*

TUESDAY 8 MARCH 2016

10.40 am

Witnesses: Mr Jo Johnson MP, Professor Sir Mark Walport and Mr Gareth Davies

USE OF THE TRANSCRIPT

This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.

Members present

Earl of Selborne (Chairman)
Lord Cameron of Dillington
Lord Hennessy of Nympsfield
Lord Kakkar
Lord Maxton
Duke of Montrose
Viscount Ridley
Lord Vallance of Tummel

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Examination of Witnesses

Mr Jo Johnson, MP, Minister of State for Universities and Science, Department for Business, Innovation and Skills; **Professor Sir Mark Walport FMedSci FRS**, Government Chief Scientific Adviser, Government Office for Science; and **Mr Gareth Davies**, Director General for Business and Science, Department for Business, Innovation and Skills

Q144 The Chairman: Good morning, and welcome, Minister, Sir Mark and Mr Davies. We are most grateful to you. As you know, this is our last oral evidence session on our inquiry into the relationship between EU membership and the effectiveness of science and research in the United Kingdom. As always, we are being broadcast, so I am going to ask in a moment whether just for the record you would formally introduce yourselves, and if you would like to make an opening statement, of course we would be delighted to hear it. Minister, would you like to start?

Jo Johnson: I am Jo Johnson, Minister for Universities and Science.

Professor Sir Mark Walport: I am Mark Walport. I am the UK Government Chief Scientific Adviser.

Gareth Davies: I am Gareth Davies. I am Director General for Business and Science at the Department for Business.

The Chairman: Are you content that we go straight into the questions rather than go through an opening statement? Thank you.

We have heard frequently in both the written and oral evidence how well this country does out of the European funding mechanism for science. It is absolutely correct that we have indeed done extremely well out of the various framework programmes over the years, but, of course, there are other sources of funding for business and then there are structural funds that, by their nature, will go to the more deprived regions of Europe, as is intended. We have to admit that we are still not entirely clear how the total level of R&D funding from the European Union to the United Kingdom compares with other countries and what the total is. We would be grateful if you could give us your understanding of how well the United Kingdom performs compared to other member states in total R&D funding. Secondly, is our performance any better or worse than you would expect from a country with a research base of the strength of the United Kingdom?

Jo Johnson: Thank you, Lord Chairman. It is a pleasure to be here and I am glad to have this opportunity to give evidence at the end of your Committee's inquiry into this important and very topical subject.

Turning straight to your question, which is a key one, it is clear that we do very well in winning European research funding. We won about €7 billion under the last framework programme, which ran from 2007, as you know, to 2013, and that made us one of the largest beneficiaries of EU research funding. Putting that in context, we have been winning around 15.5% of these funding streams. In relation to our contribution to the EU budget, that means that we are outperforming our input into the overall EU budget by three or so percentage points. That is roughly in line with our GDP share as an economy of the EU as a whole, and it is in excess of our population share. We are coming second after Germany in the overall quantum and shortly behind it in percentage. Is that about right relative to what you would expect, given the excellence of our research base? I think we are performing very well. It is a system that is serving our science community and our universities well, and we want to continue to be able to perform well within it.

The Chairman: We have certainly been able to verify the United Kingdom's position as a high receiver of funds from the excellent base funding only. Our problem is with the structural funds. When they are taken into account, we find it difficult to assess our performance. Would you expect us to be receiving funding from this source for research and development and innovation?

Jo Johnson: I think it is clear that the structural funds and the regional development funds are performing very different tasks compared to the role that we want the science flows of money to play. As you said, the structural funds are about helping disadvantaged, more deprived areas of the European Union to develop the capabilities to be competitive and eventually to be in a position where they are capable of competing for the science streams of money. They have quite distinct roles. The UK, given that it is an advanced economy with a per capita GDP above the EU average, is unlikely to be winning an outsize slice of those structural funds. Indeed, that is why we are winning only a relatively small proportion of them in areas such as the west of Wales, the valleys, and Cornwall. Relatively few areas of the UK are significantly below the per capita EU average, and I think the threshold is now 75%; that is the cut-off point. It is not surprising that we get relatively little of those streams of money.

We want to see a continued approach that maintains a clear distinction between them, and we want to see the science money from the EU continue to be very clearly focused on funding the best science, wherever it is in the European Union, regardless of geography, and regardless of what you might call purely pork-barrel pressures. We want the best science to get the science funding, and other streams of money can address issues of regional deprivation and levels of economic development.

Q145 Lord Kakkar: I want to explore a bit further the balance between funding levels for Horizon 2020 and structural funding. From the overall UK perspective for research and development, what do you believe the best funding balance to be between those two sources?

Jo Johnson: The good news is that within the EU budget we are seeing an increasing share going to areas of expenditure where the UK does well and that deliver the best value for

money, or very good value for money, for the UK. The 2013 multiannual framework agreement that set the budget for the period we are now in saw an overall real-terms reduction in the EU's budget for the first time, so it is now less than 1% of the EU's GNI, and within that smaller budget we saw an increase of about a third of the amount of science funding being spent by the EU, which helps us in two directions: first, towards a smaller overall pot; and within that smaller overall pot a bigger amount going to an area where we outperform. We want to see those sorts of trends continue.

Lord Kakkar: So that is where we outperform: in the competitive, research council-type funding.

Jo Johnson: Exactly.

Lord Kakkar: On the structural funds, one thing we have heard is that the Commission may be exploring synergies between the Horizon 2020 competitive funding and the structural funding through member-state smart specialisation strategies. Does that mean that down the line the approach that looks at excellence as the basis for the distribution of the bulk of science funding through competitive bids might be undermined in some way, and what is our smart specialisation strategy with regard to that European Commission discussion?

Jo Johnson: We see a role for some synergy between these two streams of money, while maintaining a very clear distinction in their overall objectives. If the structural development money is being used to help build up capacity for excellence in areas that are deprived, or are underperforming or that have not traditionally received significant science support, that is consistent with separately continuing to use the science expenditure to fund excellence wherever it is found, and the UK has benefited from some of that synergy itself. I can give you an example. In Manchester we have Citylabs, a newly developed £20 million biomedical centre of excellence. This is a project that sits within Manchester's Oxford Road corridor, including two universities, Central Manchester University Hospitals, and many companies, and it is an example of how these sorts of synergies can be consistent with continuing to fund excellence.

Lord Kakkar: If I may, Lord Chairman, I will ask one further supplementary question. In terms of the structural funding that has been available for some years now, has there been any assessment at Commission level that the investment of those structural funds in other parts of Europe has resulted in, first, improvement to facilities, and, secondly, the ability of locations that have received structural funding to become more competitive for the research excellence funding?

Jo Johnson: I am not aware of that analysis being carried out, but my colleagues might be.

Professor Sir Mark Walport: No, I am afraid I cannot help.

Gareth Davies: Neither can I.

Q146 Viscount Ridley: I want to ask a series of questions about the implications of Brexit for the science budget, and particularly, in the first instance, your estimate of the likelihood of the Treasury increasing R&D funding to compensate for the loss of EU funding in the event of Brexit. I realise that there may not be a government line on this, but your personal views would be interesting.

Jo Johnson: My personal views, I am afraid, are neither here nor there. As a member of the Government, I am not really entitled to personal views in this Committee. I think it would be

inappropriate for me to try and pre-empt future budgets. We simply do not know what kinds of claims or other national priorities there would be in the event of Brexit, as you describe. For those reasons, I am afraid I cannot really begin to speculate on the kinds of decisions which future Chancellors might be taking in that kind of circumstance.

Viscount Ridley: To follow up on that, if we had a Brexit, how likely would we be to become an associate to programmes such as Horizon 2020, as indeed many other non-EU countries are? In other words, how likely is it that we would have to increase domestic spending to substitute when we might still be a full paying member of these programmes?

Jo Johnson: This is one of the unknowns that the Brexit and the Leave campaign face, or we all face, because we do not have a clear sense of what the relationship would be between the UK to the rest of the European Union. The Government have set out a number of alternative scenarios that currently exist around Europe and beyond, and none of them is seen as coming close to matching the advantages that we gain from being in the single market and being a full player.

Viscount Ridley: That is a general point rather than about the science budget itself. There are, I believe, 13 associated countries in the EU funding programmes that are not in the EU. Is that right?

Jo Johnson: I cannot confirm the exact number, but it might be of that order.

Professor Sir Mark Walport: May I come in on that one? That is correct, but of course being an associated country does not give you the same rights with respect to the programmes, you do not have the opportunity to influence them, and the negotiation would be detailed because it depends on how the UK would conform or otherwise to other of Europe's policies, so being an associated member is not entirely straightforward.

Viscount Ridley: I am not quite clear about this business of not being able to influence them, because countries like Norway contribute to these programmes, take part in them, and do indeed sit on the project committees.

Jo Johnson: But they are not members of the Council, and they are not members of the Parliament.

Viscount Ridley: The European Council and the European Parliament are the two distinct bodies, are they?

Jo Johnson: And they[1] do not shape the programmes. Over the years Britain, for example, has argued successfully for EU science funding to flow to where the best science is being conducted, and that benefits us, having a strong science and research base, so the sorts of influences that we have been able to exercise we would not be able to exercise on the outside, not having a seat at the table.

Viscount Ridley: One final point: I just wanted to confirm a particular number. If we did Brexit and if there was a proportion of our science funding that we no longer got from the EU and that had to be replaced, what number would it be? What percentage of total R&D funding in the UK, both private and public, would we have to replace? I have seen the figure of 3%. Is that right?

[1] Associated countries.

Jo Johnson: It is always going to be a notional number, because funding on the way in is not hypothecated to specific areas of expenditure, so you are always going to be comparing an infinite number across the entire EU budget—

Viscount Ridley: No, it is an output number that I am looking for.

Jo Johnson: —based on our share of the EU research streams. You are approximately right: 12% and 15% are ballpark estimates of our input contribution to the EU budget and our output share of the specific research funding streams.

Lord Hennessy of Nympsfield: We have had a witness, who is pro Brexit, suggesting that the Treasury would have a moral obligation to keep the science fund up if we left. I admire the Treasury deeply. They are misunderstood people, they get a bad press, but I do not think they do moral obligation, and suggesting that funds are hypothecated for a particular purpose is like holding a crucifix to Dracula for the Treasury, is it not?

Jo Johnson: Indeed. I think it would be rash to pretend that it would be easy to replicate this rich additional funding stream—the three percentage points that we were just discussing—in the event that we were no longer able to win the outsize share of EU science funds that we presently win. As I was saying earlier, we cannot predict what our financial circumstances will be in the event of a decision to leave the European Union, we do not know what condition the national economy will be in, we cannot say now what competing priorities there will be for any resources that become available, so it is very difficult to know what kinds of pressures the Treasury would be under.

Q147 Lord Cameron of Dillington: Sajid Javid, in his evidence to the House of Commons, said, "Whether we are in or out of the EU, we will still be a global science giant". Is that actually the case, and if it is, is the scientific community overstating its enthusiasm for EU membership?

Jo Johnson: I think it is undeniable that we were a big player in science long before the European Union came into existence. Many of our great universities have been around and were successful as centres of learning long before even the countries that are now part of the European Union came into existence, so I am sure we could continue to be a player in science and to thrive in loads of ways. The question for me is whether we would be as strong as we could be without access to those additional funding streams that we win in Europe, without access to the shared facilities, which we would find hard to build or construct all on our own, and whether we would be able to replicate easily the kinds of relationships and partnerships that we have built up over many years with other EU institutions. It is not that we would not thrive or that we would not continue to be a player in science; I think that would be to overstate the case. It is just whether we would be as strong outside as we could be, continuing to build on these relationships that we have put in place over a number of years.

Professor Sir Mark Walport: I agree with all that. Science capability is about three things: the funding, which we have talked about; the people; and the facilities. It is interesting to look at the people. At the moment, 30% of European Research Council grantees working in the UK come from other member states; and 15% of UK academic staff are from continental Europe, which compares with 11% of the whole of non-EU, so not only the funding but the people are very important. Then there are the science facilities, where there are many

examples of partnerships with EU. We are very good at science, but we are even better at science because of that participation in European science.

Lord Hennessy of Nympsfield: Minister, nobody is prouder than I am, and I am sure you too, of the "thinking heavier than our weight in the world" factor, the extraordinary value that we get from our science. All the metrics are wonderful, it is the greatest success story, but to call Britain, as you did the other day, a scientific superpower since the Enlightenment has a whiff of hubris about it. If we were such a scientific superpower consistently since the Enlightenment, we would not be going through the agony in relation to civil nuclear power, which we cannot do on our own any more, having led the world for so long. I know that in politics you have to overdo it occasionally, but was it not courting misfortune to use that phraseology?

Jo Johnson: I do not wish to come across as hubristic, obviously, but I do think that we are a very strong player in science and there are facts to support that assertion. We have a very high share—16%—of the most important research globally, and we generate that with a very productive research base that receives only 3% of global R&D spend, so we do generate a disproportionate share of the most important research globally. A 16% share of any economic activity calculated on a global basis I think entitles you to claim to having a certain standing in the world of science, and I think we do.

Lord Maxton: One of the things that tends not to be mentioned, and has not been much mentioned on this, is the input of private investment into research in this country: in other words, major global players, big companies, that put money into research. How much is that, and do you think these global companies will continue to put research money into Britain if we left?

Jo Johnson: That is a very important question. The mix in R&D is approximately one-third public and two-thirds private. Of the two-thirds private, Britain is unusual to a certain extent in that a lot of the R&D that comes from the private sector comes from foreign-owned companies, and of that it is reasonable to assume that a certain amount of that inward R&D into the UK is coming because we are in the single market, because we are a bridgehead into the world's biggest trading area and so on. It is obviously very difficult to calculate how much of that would be at risk, but there would definitely be significant uncertainty over future flows of that proportion of R&D, and over however much of the rest of it—we do not know.

Lord Maxton: Why would they stay investing when they already have footholds elsewhere in Europe?

Jo Johnson: Those are important questions for the people advocating Brexit to answer.

The Chairman: Lord Ridley, I am not asking you to answer that question.

Viscount Ridley: I want to press Sir Mark on a point he just made about the proportion of people in British labs who are from the EU versus other parts of the world. If you are running a lab and you have the option of hiring somebody from the European Union versus a very talented Indian or American, is there a danger that you might, because it is easier to get the EU person in, recruit him, even though he is not quite as good?

Professor Sir Mark Walport: Having spent a career in science, the quality of good scientists means that the brightest minds will be supported wherever they come from.

Viscount Ridley: Even if it is easier to get through the visa process?

Professor Sir Mark Walport: There are ways in which the UK is open to scientists from around the world.

Viscount Ridley: We are constantly hearing that scientists are very upset about how difficult it is to get people through the visa process.

Professor Sir Mark Walport: One would need to look at individual cases, with respect, but I think that overall the UK is open to scientists, and all the evidence is that scientists are very rigorous in recruiting the brightest minds.

Jo Johnson: Can I come in on that for a second? The facts are quite powerful, I think, in this case. We in the UK give over half of all student tier 4 visas that are issued anywhere in the European Union. We have a system that is genuinely open to international students. We continue to make clear that there is no limit on the number of international students who can come here, and no limit on the number who can stay on and find work, provided they get a graduate job with a sponsoring employer. On the movement of scientists, there are also mechanisms in our visa system to give privileged access to PhD-level people from non-EEA countries; they get preference in the tier 2 route. There are also mechanisms for those coming in on temporary research programmes through the tier 5 route, and there is no cap at all on the number of such people who can come in on the tier 5 route.

Viscount Ridley: So we would be likely to apply that to EEA if we were outside the European Union.

Jo Johnson: That is the regime that applies to the non-EEA countries.

Viscount Ridley: No, I am saying that if we were outside, we would still apply it to the EU and the EEA, probably.

Jo Johnson: With respect to the EEA, we have the advantages of mobility within the European Union, an ability for our research community to hire people from across a body of 510 million people, and we have student mobility programmes that are tremendously beneficial. Some 150,000 EU students are presently studying at our universities, enriching them in all sorts of ways. We have had over 220,000 UK students take advantage of the Erasmus+ programme over the years. These are really important, mind-broadening opportunities that we do not know would continue in the event of Brexit.

Viscount Ridley: I completely agree that they are wonderful programmes. The question, given what you have just said about how easy it is to get the best minds from anywhere in the world, is: why would it be different if we were not in the European Union?

Professor Sir Mark Walport: It is about the overall quality of the environment, and that also goes to the question that was just asked about private R&D investment, because that is important in relation to where scientists move around. I will read you a quote from the BioIndustry Association's 2014 manifesto: "Europe is the single biggest global market, and access to this market is a key reason for global biopharmaceutical companies deciding to establish their European headquarters in the UK and invest in R&D activities … it is vital that the UK remains engaged in the EU and takes a leading role in shaping legislative and regulatory policy developments affecting the life sciences". The evidence that you had from Siemens again reflected that issue for the industry, so where scientists choose to move is going to be influenced by the overall environment: the universities, the international

facilities, the industrial R&D. It is an amalgam of all these that is important, and all the evidence is that EU scientists come here in large numbers at the moment.

Q148 Lord Hennessy of Nympsfield: Does BIS have a contingency plan for the science community if we leave the European Union?

Jo Johnson: This is a question for the whole of Government with respect to the EU referendum and possible outcomes of it. The Government are campaigning for a positive vision for Britain within a reformed European Union, and all efforts are focusing on making sure that we have a positive campaign in which the facts are out there and people are able to make an informed choice.

Lord Hennessy of Nympsfield: So that is a no.

Jo Johnson: Again, it is a decision that relates across the whole of government.

Lord Hennessy of Nympsfield: We have had this line from several Ministers. Why can you not just say, "No, there is no contingency planning"? I invite you to say, "No, there is no contingency planning".

Jo Johnson: We are focused on making the most positive case for Britain's future in a reformed European Union, and all efforts are going on that.

Lord Hennessy of Nympsfield: The Bank of England has elaborate contingency plans. Does it not strike people as odd that Her Majesty's Government do not have any at all? It was the same with Scottish separation: there were two Cabinet decisions specifically not to do any contingency planning for Scottish separation. If I were uncharitable, I would say that it amounted to a dereliction of duty, but I am not uncharitable, so I will not.

Jo Johnson: The question whether it is a dereliction of duty is better directed elsewhere than to the Science Minister. This is a broader policy position across government.

Lord Hennessy of Nympsfield: I know you cannot be an individual today, which is a great pity because I would love you to be, but are you actually happy in your heart of hearts that you are doing the square root of damn all for contingency planning for the science community in the case of Brexit?

Jo Johnson: What we are doing is making sure that the British public is well informed ahead of this important decision on 23 June and in a position, on the basis of the best possible evidence, to exercise an informed choice in this important matter.

The Chairman: Lord Hennessy reminded us that the Bank of England has indeed decided that contingency plans in the event of Brexit are necessary and has put them in place. Given the importance of science to our future economy, its critical role in fact, why is a different decision therefore needed for science compared to our financial system?

Jo Johnson: This is a broader question for government as a whole rather than a specific one for science or for BIS, and I cannot really add much more to what I have said already to Lord Hennessy.

Q149 Lord Vallance of Tummel: Can we come back to business for a moment? We heard in evidence that in Germany the relationship between government, business and the scientific community was more closely aligned than it is in the UK, and that does not seem to have done German industry any harm, not least in being able to attract EU funding. I wonder

whether the creation of the catapult centres or the move of Innovate UK from grant funding to loan funding will make any difference in this area, and perhaps see the UK collaborate more closely with Germany in business and science.

Jo Johnson: There are many different models for the relationship between business and the science communities across Europe, and each country develops its own model according to its own history and its own economic geography. In the UK we are adapting certain features that bear a resemblance to the Fraunhofer institutes in Germany through our catapult system, which you mention. We have committed in our manifesto to continuing to build that network out, and we have already taken steps in the first few months of this Parliament to do that, with a new precision medicines technologies catapult in Alderley Park, a precision medicine catapult in Cambridge, and others that are coming down the line. We see that as an important means of providing to businesses access to science and to shared facilities which SMEs on their own simply could not afford to build. It is an important way for us of making sure that we pull research out of the labs and get it into a state where it can help companies to develop prototypes, test concepts, and eventually move closer to market.

The catapult network is important, and we are going to be funding it over the Parliament to the tune of over £1.6 billion over the five years of operation. That includes some private money as well. Other countries have their own models, and there can be helpful learning processes for us to examine them, and we are doing just that in developing our new innovation finance products at the moment. We have looked closely at some trends in innovation finance around the world, and noted with interest that many are moving away from a pure grant-led model towards one with more loan products in the mix. Later this year we will be market-testing these new innovation finance products, which are more loan-oriented in nature, to see what part they can play in our portfolio of products that help support innovation in Britain.

Lord Vallance of Tummel: Do you have any means of measuring the effectiveness of these different models between different countries? One could crudely say: how much EU funding does business get? That would not see the UK in a very good light.

Jo Johnson: There are various indexes of how innovative countries are, which we pay some attention to. They have sub-metrics, which are ones to watch: the proportion of spin-outs per unit of research money invested, the number of patents per unit of research money invested, the rate of start-up growth, the amount of university business collaboration by value that you are generating in your university system every year. We look at a number of indicators to see how effective our innovation spend is, but it is not something that you can put an easy financial value on.

Lord Vallance of Tummel: Professor Walport, you looked as if you were about to say something on that, but maybe not.

Professor Sir Mark Walport: No, but I am happy to make a few comments. The range of ways in which businesses collaborate through R&D with academia in the UK is very broad indeed. You have the Rolls-Royce model of deeply embedded units in universities; the BioScience Catalyst at Stevenage, which is a partnership between GSK, the Government and the Wellcome Trust; the cluster in photonics around Strathclyde; the cluster in biomedicine around the very strong biochemistry at Dundee; the automotive activity in the West Midlands in collaboration with the universities. The range of business and academic partnerships in the UK is very broad indeed, and as we have discussed the catapults are a

very welcome addition to that, but there is a very broad range of different collaborative models, and against all the international scorecards, as you have just heard, the UK is doing well overall in the assessment of innovation. I think overall the UK is doing pretty well in this space.

The Chairman: Minister, you reminded us that different countries have different models, and of course we have changed our model over the last 10 years or so. As Lord Vallance pointed out, we have followed the German model in some ways. We now have the catapult centres, which I think we all accept are an excellent innovation. Likewise, of course, it was only 10 years ago or so that the Technology Strategy Board, now Innovate UK, was brought in. In hindsight, it does seem odd perhaps that it took so long for the United Kingdom to bring these bridges between industry and academia together, and of course our model allowed us to have these centres of excellence at the universities that were brilliant, and remain brilliant, in their research output. Quite frankly, the links with industry were very often seen to be less satisfactory than in some other countries. We are learning on this, we are changing, but we do have a concern that Innovate UK is still a fairly tender plant. It is up for review in a sense under the Nurse review, and there is a suggestion that it might somehow be bedded into Research UK. Are you worried that this might in some way reduce its ability to stimulate industry?

Jo Johnson: Sir Paul Nurse's review presented a very compelling vision of a reshaped UK research landscape, bringing the research councils together so they could be more than the sum of the parts while continuing to maintain their individual identities and individual ability to represent their individual communities. He had the idea of one university with seven faculties. We see Innovate UK's role in the proposed RUK as the commercialisation arm, among other functions, of the research councils, so it would sit beneath the seven verticals as a sort of horizontal function, helping them to make the most of their research and helping business to make the most of the important ideas that are being generated in the research base. We see it as playing a really, really important role in bringing out the impact that our research is capable of and making sure that we find real-world applications for as much of it as is possible.

Innovate UK's distinctiveness as an innovation agency will not be lost. We see it as important that we continue to have an identifiable entity within Research UK, and we would continue to want it to have a clear business-facing focus, and to continue to have its own distinct and separate funding stream, because, as you know, Innovate UK is not presently funded from within the science ring fence, so it would be funded distinctly from other bits of RUK.

Q150 The Chairman: I quite accept that Sir Paul was asked to look at the research councils and come up with models that might further the cause, and I think that Innovate UK's relationship with the research councils, from their point of view, is nothing but desirable. We would like assurance that, given that much research funding does not come from research councils—it can come from charities, from business itself—there must be the ability for Innovate UK to keep a close relationship with these other sources of research funding. Are you satisfied that this closer relationship with the Research Councils UK will not inhibit these other connections?

Jo Johnson: Yes, I very much am. I would like to invite, if I may, Gareth to come in on that and add a bit more colour to it.

Gareth Davies: The main thing I would emphasise is that there are already strong working relationships at the chief executive level between the heads of the research councils and the chief executive of Innovate UK. It is a system where, essentially, good people are working across boundaries. As the Minister said, the goal is to make the collaboration simpler between sectors. On your point, which is critical, the heads of the research councils are not only interested in the funding that they are making in their own individual funding decisions, they also need to be leaders of their subject disciplines in the whole country. They should be world-class researchers in their own disciplines. As such, that relationship between the head of the relevant research council and the head of Innovate UK should involve an overview of the whole of that research endeavour to ensure that we are world class not only in research but in translation and commercialisation.

Viscount Ridley: The moment has passed for what I was going to say.

Q151 Lord Maxton: I am a little unclear, because we keep talking about the UK, but, with all due respect to you, Mr Johnson, you are not a Minister for the whole of the UK; you are a Minister for England very largely. Presumably there is devolved power. For instance, the universities in Scotland are devolved.

Jo Johnson: With respect to science and research, that is a UK-wide reserved function.

Lord Maxton: Even in the universities?

Jo Johnson: We fund science wherever excellence is in the UK.

Lord Maxton: In that respect, but part of your remit is not that, is it?

Jo Johnson: On higher education that is clearly devolved, but science and research funding is reserved.

Lord Maxton: Do you benchmark support that government gives to businesses in the way the rest of the European countries do not? Have the changes that have been made in support from the switch from the regional development agencies to local enterprise partnerships made any difference?

Jo Johnson: Gareth has the history of the changes since the changes to the RDA, so I will ask him to come in on that.

Gareth Davies: The critical issue here is the local enterprise partnerships and the role they play effectively in defining and promoting the offer to businesses in their local areas. Some £2 billion of funding—we are looking at growth deals—has gone through those LEPs. Critical, though—and this brings in the wider connection with science and research funding—is the smart specialisation strategy, which we touched on earlier. At national level, we are supporting the local enterprise partnerships in their smart specialisation strategy. This is critical to being able to bid successfully for £600 million of European innovation funding. What is important is that local areas need to know what their comparative advantage is relative to other areas in the country, but also internationally. The Minister recently also launched the science and innovation audits, which are part of that strategy to look not only at the public assets, infrastructure and funding but at the business assets and, potentially, into areas led typically by leading universities to come into consortia to identify what their comparative advantage is from a world-class perspective. I have been speaking to areas in the north-west, Liverpool—Sir Mark and I were at Leeds recently—and looking to them to think about what their comparative advantages are, where they can build on that area of

comparative strength and where this needs to go in supporting those areas as they bid in through structural funds but also in giving a longer-term strategy through Horizon 2020 and bidding into our own domestic research funding.

Q152 Lord Vallance of Tummel: This comes back to my question about Germany. In Germany there is a very intimate relationship between government and business, and government will help business in a big way to see its way through to get funding. It is a well-established system. Here one gets the sense that the system is not so well oiled and, indeed, that since the RDAs have disappeared that a cog has dropped out of the engine. Am I wrong?

Gareth Davies: I see this as a critical role for Innovate UK. As the Minister was saying, Innovate UK's relationship with business is key. We have asked them, along with the NCUB, to create smart specialisation hubs, which essentially are the gateway for accessing both how to develop their smart specialisation strategy and how to reach in and access Horizon 2020 and the structural funds. It is very fair to say that we are looking to ensure that Horizon 2020 is as simple and non-bureaucratic a process as possible for business to access. More needs to be done, and our voice through the EU enables us to reform and simplify that programme. Locally, business support comes through Innovate UK, its partnership with the NCUB and the knowledge transfer networks, which recently celebrated their 40th anniversary and are seen as a very successful part of the science and innovation landscape, particularly the partnership with business.

Q153 Lord Kakkar: It has been suggested during this inquiry that the UK Government absorb scientific advice into policy more readily than the EU in general, that therefore there could be a risk that UK policy is made less effective by compliance with EU directives that rely on an EU model of scientific advice that is quite different from our own, and that therefore we are potentially disadvantaged. Minister, do you have a view on that?

Jo Johnson: I can say that we welcome the recent introduction of the Scientific Advice Mechanism and the presence of Dame Julia Slingo as one of the members of the high-level group. It is good that EU policy-making is going to be informed by the best possible scientific evidence. We welcome this direction of travel. Commissioner Moedas is taking lots of positive steps in this respect, and a lot of his work should be warmly welcomed. If I may, I think Sir Mark has a valuable perspective on this as a provider.

Professor Sir Mark Walport: Thank you very much indeed. First, the Scientific Advice Mechanism has been established in Europe for a much shorter time than in the UK. We have a history of 50 years of a very well-embedded system that involves not only a Government Chief Scientific Adviser but departmental chief scientists, scientific advisory councils and committees. The EU is going through a process in which it started with a single scientific adviser, Anne Glover, who was not supported by a substantive secretariat, to a model that now brings together a committee of seven people, as the Minister has said, strongly supported by a secretariat and by Commissioner Moedas. The UK has had a very substantive feed into that process. Sir David King was involved in advising the Commission and helping to select that group of science advisers, chaired by Professor Wegener.

All the evidence is that the Commission is taking scientific advice very seriously, and there is a new mechanism. It has consulted very extensively. I met Director-General Robert-Jan Smits last June to provide information on the UK system. Our officials remain in touch. As you have

heard, Dame Julia Slingo is a member of the high-level group. All the evidence is that it is moving in the right direction.

The second part of your question is whether UK policy is made less effective by compliance with EU directives. In some ways that is a different question. One could look at three areas where the EU directives are very important and the UK has played an important part. One could look at the data protection regulation, the invasive non-native species directive, which was pushed for by the UK, and the clinical trials directive. These are all important directives.

If we start in reverse order, the development of drugs is a global activity, so having a European market and clinical trials directive that works is very important for the UK. As a number of your witnesses have emphasised, harmonisation is extremely important to help this happen. A new clinical trials regulation, which was approved in 2014, comes into force this year, which is aimed at cutting the bureaucracy of the old directive. It streamlines the authorisation process for drugs trials, cuts red tape for products, and simplifies reporting.

On the data protection regulation, where there was a lot of toing and froing and an eventual trialogue, on research the UK played a leading role in Europe in bringing together European science bodies and putting the regulation into a good shape in supporting the responsible use of data for research.

The case of the non-native species directive is an important one, because if there is one group of organisms that does not mind about borders it is invasive species. There is a whole string of those. The UK is widely recognised as having very good practice. It was as a consequence of our pressure that there was a draft regulation in 2013, and it came into force on 2 January 2015. The GB strategy is widely held to be one of the best in Europe, and many of its features formed the basis of aspects of the EU proposal. On 4 December, 37 species were adopted by majority and the UK voted for the list. It is an example of a directive that is important to the UK and that came about by our membership of the Union.

Q154 Lord Kakkar: Could I come back to the new Scientific Advice Mechanism that has been established in the European Commission? We heard some evidence that there are potential concerns about the balance between it being a proactive mechanism that will look at topics and take them to the Commission, and a reactive one that responds to questions that the Commission may put to it. Do you have a view about that? Secondly, what interaction do you think there will be between other European institutions—the European Parliament, for instance, and the Council—with regard to the Scientific Advice Mechanism as opposed to its relationship with the Commission?

Professor Sir Mark Walport: Dame Julia gave you evidence, and she is the most direct source. The important issue for science advice is that it has a customer at the other end. There is always an element of toing and froing and discussion about the areas where science advice is important. Two areas they have been asked to look at are cybersecurity and real-world CO_2 emissions from light vehicles—a topical topic. I am aware that there is also discussion. It will be an iterative process of discussion between the Scientific Advice Mechanism and the Commission itself.

Lord Kakkar: In our own country with a very mature approach to and mechanism for science advice across all government departments, as you said Sir Mark, what is the opportunity for the scientific advice mechanisms that we have to contribute to thinking about now with this

European mechanism as it goes forward? Is there any proposal that national Governments would be able to interact their science mechanisms with what is being developed in Europe?

Professor Sir Mark Walport: The first thing is that they are looking at bringing chief scientific advisers together from different European countries. That was something that Anne Glover initiated, and it is likely to happen under the new mechanism. There will be a direct relationship between the Scientific Advice Mechanism and individual national scientific advisers.

The second thing is that, as part of the Scientific Advice Mechanism, national academies across Europe are also being brought into play. There are many different forums where science advisory systems in individual countries will come together with the European mechanism.

Q155 Viscount Ridley: Can I pick up something you said, Sir Mark? I wonder whether you are putting a slightly different gloss on it from what we have heard. I have no quarrel with the invasive species directive, but in the case of the clinical trials and data protection directives you have made it sound as though there were good directives that we approved and made better. The evidence that we have heard has been compelling that in both cases they were disastrous directives, which we made slightly less disastrous. In the case of the deliberate release of GMO directives, they are still disastrous. We heard that in our previous inquiry on GM insects.

Professor Sir Mark Walport: The issue is where they end up. The data protection regulation started with a position on research that the UK supported when it came out of the Commission. It then was modified in the Parliament to a position that the UK was much less keen on, and as a result of subsequent work with the Government it ended up in a position that the UK is supportive of. Directives always, in their evolution, go through phases that we and other countries may not be happy with.

Viscount Ridley: You say that what counts is where they end up, but in the case of the clinical trials directive a lot of harm was done and a lot of good research was set back by the fact that it came in in a bad form.

Professor Sir Mark Walport: I guess the issue is that whether we are in or out of Europe, the clinical trials regulations in Europe will matter hugely to us because it is one of the major markets of the world.

Viscount Ridley: One of them.

Professor Sir Mark Walport: It is the reason why the pharmaceutical industry has given you evidence that it believes that the UK is an important place to be. Therefore, our opportunity to influence directives is a very important one.

Viscount Ridley: On the deliberate-release directive, we are seeing fantastic British technology having to be tested and applied outside Europe.

Professor Sir Mark Walport: As you know, on GMOs a position of subsidiarity has been reached where individual countries can take their own decisions.

Viscount Ridley: We heard that it is not working.

Professor Sir Mark Walport: The system is that there is a European approval mechanism and individual countries can opt out. This is something that we have discussed here before. Different countries have different value systems in relation to these.

Q156 Lord Hennessy of Nympsfield: Sir Mark, as our inquiry has unfolded, I have acquired the impression—I do not know if my colleagues have—that our scientific relationship with the European Union is much less jagged than so many other of our relationships in this great 43-year psychodrama that we have been living through. Do you think it is a fair observation that this is an area where relative harmony and good things have emerged in contrast perhaps to others?

Professor Sir Mark Walport: I can comment on our science in a positive sense, but I do not think I am qualified to comment on all other areas. It is true that the scientific community works closely in Europe. It influences policies for science in Europe. As you have heard from the Minister, it has been a significant beneficiary of the European funding system for excellence, and it has profoundly influenced it. The European Research Council in its existing form recognises to a significant extent the emphasis of the UK and some other countries in Europe on supporting the brightest and the best. It is true that the scientific community has strong relationships with Europe. I cannot comment on all the rest.

Lord Hennessy of Nympsfield: Have you anything in the back of your mind that if as a country we stay in, on your side of the house, we could bring an initiative to Europe that would not be whingeing, carping or reluctant and that would take them by surprise? Just think of the shock value of coming up with something positive in the aftermath of a vote to stay in. Do you have a cunning plan forming in your little grey cells?

Professor Sir Mark Walport: I was going to say that I thought that was more a comment than a question, with respect. No, I do not think there is a plan at the moment.

Q157 Lord Cameron of Dillington: This question has already been answered, but in case you have anything further to add I will ask it again. Public funding for science is lower in the UK than in other major economies. If you add that fact to Borys's comments—the Cambridge Borys, to use Mr Johnson's words in his article, Professor Sir Leszek Borysiewicz, —that, "The total source of funding from all European-based funding is equivalent to having another research council". Do you think that those two facts influence the science community's enthusiasm for EU funding? In other words, is it the lack of UK funds that makes them take their decision?

Jo Johnson: I think it is the additionality of it, and the fact that they are doing important work and we are very successful at winning an outsized slice of this money. Our universities and science base benefits from a very significant chunk of additional money. As I said before, it would be rash to pretend that it would be easy to replace it in the event of Brexit when we would not know what other claims there might be on the public purse, nor what state our economy would be in.

Q158 Lord Hennessy of Nympsfield: If we stay in, do you think we should aim to increase the number of EU scientific facilities based in the UK? I spent a fascinating day on Friday at the Joint European Torus at Culham. I think I am right that it is the only one of any size that we have acquired during our 43 years of membership. It is a remarkable thing, and very

significant, but only to have the one over 43 years, given our prowess as a scientific nation, is a bit breath-taking.

Jo Johnson: It is horses for courses. The UK looks at these opportunities on a case-by-case basis, and where it is good value for us to bid to host them, we do. It is good that the JET fusion energy facility in Culham is there and doing important science.

Lord Hennessy of Nympsfield: That was a 1978 agreement that it should come there. That is a long time. We have had none since.

Jo Johnson: That is the whole point; we have access to shared facilities across an entire continent and do not necessarily have to build them all in the UK. Our science base has access to shared facilities of all sorts across the European Union.

Lord Hennessy of Nympsfield: Would you like rather more?

Jo Johnson: Where it makes good sense on a value-for-money basis to locate them physically in the UK, we will certainly continue to look at them, but we need to be in the European Union to have that sort of option.

Lord Hennessy of Nympsfield: Precisely.

Q159 Duke of Montrose: Rather like Lord Cameron, a great many answers have been given to the questions that the Committee wants on the record. I should say that I receive funding under the common agricultural policy and the rural development programmes. We have observed a strong consensus from across the science community—academia, industry, charities—of the value of freedom of movement across the EU for science, research and innovation. Do you agree with that position? Perhaps one of the reasons why researcher mobility is valued so strongly is because the UK's international visa system is not fit for purpose. Is this accurate?

Jo Johnson: No, I really would challenge that. As I said in an earlier answer, there is strong evidence that we continue to punch well above our weight in attracting people to this country from outside the EEA. Half of all EU visas issued to people of university age are issued by Britain. That is an astonishing statistic. They are attracted to the excellent universities that we have in this country and the great higher education that you can receive here. After university age, as I said earlier, we have adjusted our visa regime to make it easy for people with PhD qualifications and eminent scientists of all sorts to come here. Special privileges are accorded to them in the tier 2 route, and the tier 5 route is available for those coming on more temporary exchange programmes. We do feel that we have a competitive offer. We are always looking for ways to illustrate that we are open and that we want the brightest and the best to come and study and train our young people.

Duke of Montrose: Can I come in with a supplementary of my own? At the moment a great deal of our economy depends on our service industry, which will probably be shortly taken over by IT where a little man somewhere on the other side of the world will press a button and get the answer that presently comes from a very knowledgeable person in London. In the event that we have to think of where the emerging economies of China and India are going to take us, is the scientific community better in Europe or outside, free from the various constraints that you have given us?

Jo Johnson: I think we will develop faster relations with these big emerging or emerged economics if we are in the European Union, because we will have the full weight of the trade

bloc behind us when we are negotiating access to their markets. That will strongly facilitate our entry into these markets. We will get better trade deals as part of the EU than we would negotiating them as an economy of 70 million people. It is not mutually exclusive. Our membership of the European Union facilitates better relations with these markets for our exporters, and in the other direction it is unarguable that we get this outsized slice of inward investment from India, for example, that invests more in the UK than it does across the rest of the European Union, because we are in the single market and their firms can use London and the rest of the UK as a bridgehead into the rest of this big trading area that is the European Union.

Q160 The Chairman: Could I move on to a very topical issue, which is relevant not just to this inquiry but to all inquiries of Select Committees, and that is the guidance issued by the Cabinet Office on 6 February to government departments requiring them to add an anti-lobbying clause into the conditions attached to all new or renewed government grants to public bodies and charities. I understand that this clause is intended to prevent these bodies from using public funds to influence Parliament, Government or political parties. While one immediately realises that this is a perfectly well-intentioned proposal, it might have impact on evidence to Select Committees such as ours. In this inquiry, we have had evidence from organisations in receipt of government-department grants. The devil is clearly in the detail. There is a lot of concern about unintended consequences and enforcement difficulties. We are aware that BIS is working to address this situation. What type of solution, given the opportunity for total chaos, is BIS coming up with?

Jo Johnson: We recognise that this is an important issue. The Government are introducing this measure to address the potential for the misuse of public funds—money being used for purposes for which it was not granted. We are looking very carefully at the guidance issued by the Cabinet Office on exemptions to this policy. We are in discussions with stakeholders to determine exactly how this might apply to the research base, knowing, as we do, that the research base, scientists and academics make a tremendous contribution to the development of evidence-based policy. We want to put in place an exemption that continues to allow that to be possible within the framework of tight management of public money. If I may, I will invite Sir Mark to give his perspective on this question as well.

Professor Sir Mark Walport: Thank you very much indeed, Minister. In the context of R&D by individual government departments, that is commissioned to answer the scientific questions that they face on bovine tuberculosis, climate or other areas. There is an important distinction between the communication of the evidence, which obviously government wants to be done and needs to be done in as transparent a way as possible, and there is the lobbying for advocacy for individual policy positions, which is slightly different. The purpose of the R&D is to provide the evidence that the Government needs. That is the key issue.

The Chairman: It is the key issue, and that clearly is what Select Committees will be concerned about, as indeed will academia and other organisations. We need to understand much better. I think it would have been helpful if there had been much wider consultation before the Cabinet Office came up with this worthy cause. When you say that there will be exemptions, are we talking about blanket exemptions, case-by-case exemptions? What happens when exemptions are not given? What additional administrative workload will fall on BIS, or for that matter the Government Office for Science, in monitoring and enforcing

these new clauses? How will this be funded? What penalties will you impose on bodies that do not adhere to these conditions of grants? These are all important issues that we need to understand.

Jo Johnson: Indeed they are, and they are the issues that we are discussing now with the Cabinet Office: how we might secure exemptions and/or qualifications to the clause. We will be discussing exactly how exemptions or qualifications might work for the stakeholders, so we address the concerns you mention.

The Chairman: What impact do you expect it to have on the ability of Select Committees to do their work?

Jo Johnson: We would not expect it to have an impact. That is not the intention of the policy. We will give consideration to that in light of your concern.

Lord Hennessy of Nympsfield: I am sure you have very powerfully picked up the anxieties in the learned societies about this, as indeed I have. I have two points. It struck me, when it first emerged, as showing a remarkable lack of self-confidence on the part of Her Majesty's Government. In an open society, you put up with that, do you not? It is part of the toing and froing. It might be deeply irritating, and the form in which lobbying can take would put your teeth on edge, but surely in the norms of an open society it is rather central. Where does the duty of speaking truth unto power, which Mr Davies and Sir Mark have in abundance in advising you, for example, end and lobbying begin? How on earth can you police that boundary?

Jo Johnson: These are important questions. The intention of the policy, as the Chairman said, is to make sure that money is spent for the purposes for which it was allocated. When money is allocated for research, the money should be spent on research; it should not be diverted to objects not related to the original grant. That is a fairly important principle of managing public money, and we want to make sure that applies consistently.

Viscount Ridley: In contrast to my neighbour here, I am impressed that this is not about stopping people lobbying but about stopping people using money that was given for one purpose for lobbying instead. There is nothing to stop an individual from an organisation using his own money to buy his own train fare in his own time to come and lobby a politician. Is that right, or have I misunderstood?

Jo Johnson: The finer details are to be determined as we take this forward and it is introduced. I do not want to give any definitive statement on that.

The Chairman: The words "sledgehammer" and "nut" come to mind. As I understand it, this is seeking to address inappropriate lobbying with public funds. To what extent has this been a problem?

Jo Johnson: It is important to make sure wherever we can, at a time when we are making significant savings across government, that public money is spent for the purposes taxpayers understand it to be allocated for. That is pretty important. We want to make sure that wherever there is misuse of public money we crack down on it. Clearly, where it is going to create problems for academic freedom of expression we will take that very carefully into account in discussions with the Cabinet Office as we consider requests for exemptions or qualifications to the clause.

Q161 The Chairman: Clearly the opportunity for unintended consequences, as I think you have recognised, is very great. There is a responsibility somewhere in government to come up with a solution to this self-imposed problem, as I would describe it. Where does the authority for coming up with a solution lie?

Jo Johnson: It will be collectively agreed across government. It is a Cabinet Office-led policy, but all requests for exemptions would be agreed on a cross-government basis as usual.

Lord Hennessy of Nympsfield: I cannot believe that it would have been generated in your department. Did it come as rather a shock to you when it emerged from the Cabinet Office?

Jo Johnson: We recognise the strength of feeling and legitimate concern in the scientific and academic communities generally. We do not want to limit freedom of expression or constrain academic research in any way. We will make sure that the exemptions have that effect. It is legitimate for government to crack down on abuse of public money wherever it is in the system, and the anti-lobbying clause that is coming into force has that objective in mind.

Lord Hennessy of Nympsfield: Has the National Audit Office produced any evidence that there is this level of abuse?

Jo Johnson: That is for the Cabinet Office to comment on. I am not aware of it, but I am sure that officials and Ministers in the Cabinet Office will be across that.

The Chairman: Perhaps we should ask your colleague from the Cabinet Office to come and give evidence to us.

Lord Maxton: You are publicly funded.

Jo Johnson: We are publicly funded, yes.

Lord Maxton: So you cannot lobby.

Jo Johnson: Mark?

Professor Sir Mark Walport: My job is to provide advice to government. I do not comment publicly on government policy, as you know.

The Chairman: We have probably exhausted this. We have concerns, and indeed the concerns are widely shared. I am confident that you will be addressing this issue with your colleagues in the Cabinet Office. We wait with interest to make sure that it does not impact on our future work. We have exhausted our questions. I hope we have not exhausted you. Thank you for the very forthright way the three of you have answered the questions. We are most grateful. We now have to go away and write our report. Thank you very much indeed.