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. 12 *Heard in Public* *Questions 128 - 135*

TUESDAY 1 MARCH 2016

10.40 am

Witnesses: Dr Mike Galsworthy, Professor Angus Dalgleish and Mr Emran Mian

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 Fox
Lord Hennessy of Nympsfield
Lord Hunt of Chesterton
Lord Kakkar
Baroness Manningham-Buller
Lord Maxton
Duke of Montrose
Baroness Morgan of Huyton
Baroness Neville-Jones
Viscount Ridley
Lord Vallance of Tummel

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Examination of Witnesses

Dr Mike Galsworthy, Scientists for EU, **Professor Angus Dalgleish**, Scientists for Britain, and **Mr Emran Mian**, Director, Social Market Foundation

Q128 The Chairman: Welcome to this session. As you will know, we are getting near the end of our inquiry into the relationship between EU membership and the effectiveness of science, research and innovation in the UK. I hasten to add, as I am sure you realise, that in science, research and innovation we include engineering and technology, so it is a wide church. We are most grateful to the three of you for joining us today, and I am going to ask first Dr Mike Galsworthy, then Professor Dalgleish and then Mr Mian if they would like to introduce themselves for the record. We are being broadcast. If you would like to make a short opening statement, please feel free to do so.

Dr Mike Galsworthy: My name is Dr Mike Galsworthy. I am programme director for Scientists for EU. As a brief opening statement, I would like to say that Scientists for EU started on 8 May when it became clear that there was going to be a referendum on EU membership. Our concerns at that stage were twofold: first, a lack of clarity and cohesion within the community on EU benefits and Brexit risks; and, secondly, a lack of public understanding on the UK/EU relationship in science. Since that time, we believe we have accurately conveyed a majority sentiment from the UK science community to the public, bringing in new evidence and stimulating debate. We think this is a benefit to the science community and the public alike. As a final point, we would like to note that we believe this referendum is not about a dozen leading political and business voices, rather, it should be about the communities within the UK who have experience of the EU communicating those experiences to the wider public to ensure a richer picture.

Professor Angus Dalgleish: I am Angus Dalgleish and I am a professor of oncology at St George's Hospital and I am both a scientist and a clinician. I got involved in this when I became a victim, I would say, of the European Union clinical trials directive which basically stopped me in my tracks doing a programme which was very successful, leading to cell-

based vaccines and dendritic cell-based technology. Without the injection of millions of pounds to bring the facilities up to this very high level of standards, which were basically for pharmaceutical companies and not for clinical academics like myself, I was unable to proceed. This is an area which has continued to proceed elsewhere. You have all heard from America recently that a logical conclusion of this work is leading to tremendous cures for leukaemia using this cell-based technology, which I felt was completely blocked by an over-zealous interpretation of the European clinical trials directive. I am here to point out that the European Union has some good components for science, but it also has had some terrible, negative, devastatingly dreadful effects. I do not feel that we would lose any of the benefits of being in science by leaving the EU. The nature of science collaboration means we do not need a supranational imposition of how we collaborate internationally.

The Chairman: Thank you very much. Finally, Mr Mian?

Emran Mian: My name is Emran Mian. I am the director of a think tank called the Social Market Foundation, and I was formerly responsible for higher education funding in the Department for Business, Innovation and Skills. By way of opening statement, the only thing I would like to add to the points already made is the wider economic environment in which the future envelope for science and research spending might be set. When I look at the arguments for leaving or remaining in the EU in the context of science and research specifically, I think there probably are arguments on both sides. When you look at the wider economic environment in which the future of the science and research budget may be set, all the risks are if we leave the EU, and I think those probably constitute the most significant arguments in this context against leaving.

Q129 The Chairman: Thank you very much. Let me note, first of all, that we have had quite a lot of evidence, as you will have seen, that the United Kingdom is one of the strongest performers in the European Union when competing for research funding on the basis of excellence; we have a good record. We have also seen evidence that the United Kingdom is one of the weaker performers when overall funding for research and development, which of course includes structural funds, is taken into account. Of course, there is a qualification there because we, quite frankly, had some difficulty in determining how much of these structural funds are really relevant to science, engineering, technology, research, innovation and the like. Nevertheless, the figures do seem to suggest that, if you put the two together, the position is not quite so advantageous as it might be if structural funds were excluded. Do you agree with this analysis?

Dr Mike Galsworthy: I do not agree with the analysis. I think that attempting to put the two together gets into a bit of a mess. Essentially, the two are negatively correlated because they have very different purposes. The competitive funds that come through something such as Horizon 2020 are the ones that we should be focusing on, and the structural funds are part of the broader system in order to bring struggling regions up to scratch so that there can be diversity. Certainly, within this country, there have been accusations that funding tends to go top heavy and leaves many regions starved out. The European Union has a long-standing mechanism for trying to ensure that those regions that are struggling can be more economically competitive, and that avoids certain social tensions.

It used to be the case that this money was spent largely on infrastructure, such as roads and airports. However, it became clear, and this came to a head in the Competitiveness Council of October 2012, that, when it came to the science programme, the western and northern

ends of the EU were sucking up all the funds and winning all the projects and leaving the newer member states very much starved out.

There was also the issue of the researchers on EU projects there being paid at local rates and causing something of a brain-drain. There was some alarm at seeing that balance slipping, so there have been various measures put in to try and redress the balance so that eastern Europe can be brought into full play. One of those is to strongly re-purpose the regional development funds to be more research and innovation intensive. There is a policy desk within the European Commission to give advice to governments on that. There is a demand that these regions should engage in smart specialisation programmes in order to clarify what their strengths will be, and then there is an effort to bring some cohesion between those funds and their involvement in Horizon 2020. It is clear that the two funding streams have very different purposes. One is excellence, and that allows us to network with Europe and the rest of the world and engage in projects on a scale that we could not do without such collaborative mechanisms. The other is to ensure that, over time, we can more broadly have all parts of the EU playing that game. By conflating the two, you merely look at the finances of it rather than the value of the whole system, and I believe the value of the whole system is clearly beneficial because it is well structured.

The Chairman: Could I read to you a bit of your written evidence, in paragraph 1.2.14, where your organisation says, "the new focus of the Commission to dedicate regional development funds to R&I means that the whole EU ecosystem of science is strengthened in all parts. The UK, as the EU science programme's leading player, benefits strongly in the long run when it can participate in and lead (more than any other country) ever more capable teams from an ever stronger region". Would you stand by that statement?

Dr Mike Galsworthy: Yes.

The Chairman: Would either of you like to speak? Yes, Professor.

Professor Angus Dalgleish: I would like to point out first of all that the framework programme 2007 to 2013 only accounted for 3% of all the funding of science in the country, so we are talking a very small amount of money with an enormous amount of weight put on it. When we look at the competitive funding for the EU, and these are all formal government-approved figures, we received £6.9 billion out of a total of £54 billion, which is very good indeed. When you look at the structural funding, this is absolutely catastrophically small; we received approximately £2 billion-plus out of £53 billion. I think we need to look at the bigger picture, that we are paying far, far more into this than we are ever going to get out.

With regard to the idea that we would not collaborate without EU funding and then telling us where to go, I have been on these FP7 framework programmes as a referee/adjudicator et cetera, and it is a programme that I do not feel happy with any more. Initially it encouraged collaboration among European scientists with money for meetings and that was very good. Now, it wants to dictate what we research, where the money goes.

I would make it very clear that I have been horrified to see the waste when I have been to Brussels; nobody will sign off the accounts for 20-odd years and the money that is being spent there. When I went there for a three-day programme, it was very clear that they had already made up their minds where they wanted the money to go and that we were going to be bullied until we agreed so that they could have peer review. I found that was something

really rotten at the core which I was very unhappy with. If we leave the EU, we do not leave Europe and we do not leave collaborating with the rest of the world, whether it be America or Australia. I think there is too much wrapped up in the fact that we need to be in the EU in order to do the science. No, we do not. If you look at the number of fantastic organisations, which are nothing to do with the EU and in which we play major roles—EMBO, CERN, EMBL, the European Space Agency, the European Observatory, the cyclotron, XFEL, and it goes on and on—we have fantastic collaboration. We do not need to be in the EU. We are the fifth largest economy in the world and we lead in a lot of these areas.

With regard to this enormous disparity in the sum of money that we pay in and never see anything back from, which on another set of figures is over £30 billion over a five-year period, we would have no trouble at all leading in research and taking our formal position if, when we get out of the EU, some of the deficiency in funding from the Government is made up. We still get less than our colleagues in Germany and France in total, and I think that would need to be re-addressed and, when that is done, I think we would still be the leaders of science in Europe.

The Chairman: We will come back to some of those points. Thank you. Mr Mian, did you want to add anything on this?

Emran Mian: I would make a couple of small points. One would be that, whilst it is true, given the UK is such a big player in science, that it would still be competitive and continue to collaborate with lots of other European institutions, one of the factors that contributes to our competitiveness is researcher mobility. It is very difficult for me to see a scenario of Brexit in which researcher mobility is not in some way impaired. Researcher mobility is important not only to the structure of collaboration but to our competitiveness for some of these funds, by which I mean that, if researchers from other EU countries come and work in research in the UK, they bring a set of networks already with them and we then take advantage of those networks in making our universities and research projects more competitive in funding. With all of that, it is very difficult to see a scenario whereby that is not impaired if the UK were to leave the EU.

On the other argument of the balance between the two different sorts of funding that you mentioned, my understanding, and these things are always quite difficult to evidence, is that the UK is one of the important voices within the EU, ensuring that a larger proportion of funding is competed for rather than being on the structural side. In that balance between science funding being competitive versus being used for structural purposes, I think the UK is an important voice for more of it being competed.

The Chairman: I think Professor Dalgleish wants to come back briefly on that.

Professor Angus Dalgleish: As a very brief bit of information, in my own institution half of everybody is from outside of the UK and half of those are from the EU and the other half from outside the EU, so I do not see how the EU is going to change that; people are still going to come from outside the EU and work in British universities for the research and I really do not see how that is going to impact on it.

Lord Hunt of Chesterton: You said that the accounts were not approved. I have heard other people saying something rather different, so it is a canard that is often floated. For the record, since it was a public statement about the EU, I think it would be useful to know what the facts of the case are. The second point I want to ask you about, Professor Dalgleish, is

that with many of these big European projects, and I agree with you that some of them were there before the UK joined, and there have been Parliamentary Questions on this, there has been quite considerable EU involvement in the running and the programmes of big ones such as ESER, CERN or whatever, and the view of many people is that that is quite a valuable component to bringing and applying these projects. Would you deny that, or do you think that the EU contribution to these European-wide organisations is actually not valuable?

Professor Angus Dalgleish: With the way the EU has taken larger chunks of the money, it was inevitable that they would then want to get involved with things which are set up and successful. Again, I do not see any problem if we left, as we would also be involved in taking part in those things in the way that we have. I think that outside we have a much larger and more important voice in these organisations than we do as part of the EU; I think we get drowned out in the EU.

Lord Hunt of Chesterton: That is not what the PQ said.

Lord Kakkar: I want to focus a bit longer on this question of the competitive funding rather than the structural funds, to be clear about what the witnesses feel would be the appropriate balance between the Horizon 2020 competitive research funding and structural funding for Europe generally first of all.

Emran Mian: I am not sure I could express it by way of a formula, but I think the broad approach, and this is similar to the way in which we have deployed the portion of research funding given by HEFCE in the UK, is to strengthen institutions that might begin from a weaker position or might be based in regions of the UK or the EU that are in a weaker position, so you use structural funds to begin to level the playing field. Then, as soon as possible and wherever it is possible, you want to use competitive funding, not only as a way of funding the best research but as a way of encouraging everybody to continue to raise their game. Over time, what I would probably want to see is a balance, just as has happened in UK funding, so the same thing happening in EU funding where we rely less on structural funding for science and more on competitive funding.

The Chairman: Dr Galsworthy?

Dr Mike Galsworthy: I think that is an excellent question and exactly what we should be thinking about and I fully agree with what has just been said. I think it is in the long-term interests of the EU and us if there is a shift towards more of that funding which goes into regional development going into a competitive scheme because we know that the value returned on that is large. Also there is a need to ensure that the eastern European countries and southern European countries, which have been particularly hit recently by global financial circumstances, are able to play fairly so that they are not constantly struggling.

I think the best mechanism for doing this is not necessarily giving money directly to regional authorities for them to spend as they will but, rather, to have competitive programmes, such as within the widening participation mechanism of the Horizon 2020 programme where you pair up leading institutions, such as we have in this country, with those in regions that are struggling. The benefits of that are twofold. Those regions get to work directly with the very best that we have within the EU and the transfer of technology in skills and capacity will have much more rapid benefit. Also it benefits us in that, when we have those pairings, we develop skills in boosting the effectiveness of science, technology, research and innovation and that is a global, marketable service which we then can take elsewhere. This is the

thinking now within the Commission, certainly there are bodies that are advocating this kind of thinking because then, with issues such as accounting, you do not have to rely so much on regional authorities feeding back to the Commission and, with our net contribution, there is then a clear direction as to how that can be reduced so that is less of a bone of contention. Regarding collaboration, this is a very clear way to start bringing struggling regions into direct contact with the rest of us and into networks. This is actually where the thinking is going and, therefore, I believe that the future of the programme is dynamic and headed in the right direction and will bring significantly more benefits than it even does now.

Professor Angus Dalgleish: I would say that sounds very nice, but I do not believe a word of it in practice. We give far too much to Europe to spend on infrastructure. Anybody who travels around Europe, as I do a lot fortunately, sees how much European Union infrastructure money is completely and utterly wasted, and we are contributing to it. The dreadful parlous state of southern Europe is all due to the euro and the euro crisis, and it was not only a financial crisis. By being part of the European Union, we are contributing to what is a gross instability between the north and the south of the EU. I would say again that I disagree. I think that the structural fund difference, which is well over £30 billion, if not more, is far too high a price for us to pay for what is basically nirvana and that there are many other ways of doing it.

In my own lab, I have just realised that half of them are from EU countries and that is not going to change if we do Brexit and leave Europe; we have already cemented these relationships with laboratories and institutions abroad. The other thing is that a lot of our science is actually a very close collaboration with the US and they are not in the EU.

Baroness Morgan of Huyton: That is why you do not think that will change. I do not really understand what you are saying. One of the obvious implications of Brexit would be a change in the movement of people within Europe and the ability of people to work in different countries within the EU, so I do not really understand how you can think that your laboratories would stay staffed in exactly the same way.

Professor Angus Dalgleish: With science, it has never been a problem taking people across borders. The whole time I have been in science, laboratories have always been international and people have always had approval to come and work in different laboratories.

Baroness Morgan of Huyton: That is not the position at the moment in a lot of universities. As this Committee has discussed before, there is a real problem for people coming in from outside the EU at the moment, and one would only expect that would increase across the piece if part of the reason for doing this was to reduce immigration. I do not really understand the rationale.

Lord Kakkar: To focus again on the success of the application of structural funds to date, is there evidence that the investment of structural funds over the past years has resulted in that movement of institutions from requiring structural funding to being truly competitive regarding the competitive research stream funding of the European Union, or is that still anticipated to happen in the future?

Emran Mian: I have not seen any compelling evidence that it has worked, and that is a gap in the evidence base for sure.

Lord Kakkar: So the United Kingdom's position here, if I have understood it correctly, is it would serve our science interests best if the move were away from structural funding and

were to focus more and more on competitive funding, but those competitive funding streams would facilitate the participation of institutions that were potentially on a trajectory towards becoming true science competitors across Europe?

Emran Mian: I think it is certainly true that competitive funding favours our universities simply because of the strength of our science and research base. The observation I was making was that, if over time there continues to be a shift in the balance of EU science funding towards more of it being competed for, and we are a strong voice within the European Union for that end, then that will play to the advantage of the UK science base and indeed to the universities across Europe with whom we collaborate.

The Chairman: Dr Galsworthy, do you want to come in on that same point?

Dr Mike Galsworthy: I would say that we have two interests. One is increasing competitive funding because we do well at winning it, but we also have an interest in strengthening the pan-European ecosystem around us. Whether we are getting impact from the structural funds is, I think, a great question. I think that the move to deliberately put structural funds into research and innovation is too new to see that yet. It used to be quite woeful how much the Commission actually analysed where the money went and what impact was happening. I think it is getting much better at that now. The interesting comparison would be between the widening participation scheme, which does all those twinning and pairing mechanisms that I was talking about, with the direct structural funding—and getting some feedback on which of those people believe is more effective overall. There is nothing yet on that because it is all too new, but I think that will be coming through at some point and that certainly should be a major focus of the entire research and innovation vision of the European Union.

Lord Kakkar: To be absolutely clear, as far as anyone is able to say at this moment, we do not have evidence from previously invested funds that the structural funds which have been used so far for the purpose of bringing up the broader science game have made institutions more competitive for competitive funding?

Dr Mike Galsworthy: We do have some great examples, but we do not have quantitative evidence. To give one lovely example, Ulster is, shall we say, an under-competitive region by classification and there was some money from the European structural funds given to Ulster University to help set up an independent research institute, called NIBEC, which develops medical technologies. That has now spun out various companies to a value of some millions, which I can look up for you, but, importantly, the medical technology that was developed there is now found in the White House and on Air Force One. It is strongly felt by that department that they would not have had the capacity to be world-leading in the way that they are without this funding from the European Union to build up. In some cases, it clearly has been a productive mechanism, but we need to get this in quantitative terms of course.

Baroness Neville-Jones: Professor, am I right in concluding from what you have said that your objections to UK membership of the EU go rather beyond what you regard as being the damaging, deleterious or irrelevant participation of the UK in the science area, that you have a broader objection as well as your personal experience, which obviously you did not enjoy, in the case of scientific collaboration with the EU?

Professor Angus Dalgleish: The short answer is absolutely yes. I was impacted and have done so much research and reading and prodding away at the whole history of the European

Union, and I have a much broader resentment for what they have done to the British Parliament.

Duke of Montrose: To my mind, the structural funds, certainly up in Scotland, where I come from, were based on regional need, and in Europe the amount of money available is based on regional need. Is there a differential between what is available for research and investment and what is available for physical structure? Are they now trying to lay down more of a distinction?

Emran Mian: My understanding is that the qualifying criterion is the same for all structural funds, which is that they can only go, I believe, to regions which have—I think it is—less than 70% of average EU GDP.

Q130 Baroness Morgan of Huyton: Can we talk about the associated country status, because this is an issue that we have talked about a lot with previous witnesses? We have heard a lot of arguments that associated country status would mean that the UK would lose influence over EU decisions. I can probably guess what your answer is going to be, in all honesty, but we need to know whether you agree with this assertion because, although we have had relatively clear-cut answers on both sides, it would be useful to get that on the record. In particular, we really want to explore how much our influence would be cut back if we were not a member of the EU and to what extent you believe, if we were an associated country, we would still be able to exert significant influence over EU decisions relating to science funding and research.

Emran Mian: I think the level of our influence will depend almost entirely on the nature of the deal we get in the event of an exit. I imagine it is likely that the single biggest factor will be how much of a contribution we continue to make to the EU budget. If, for example, we were making 80% of the contribution that we make at the moment, then you would expect that we would retain quite significant influence in how those funds are then invested. Obviously, the flipside of that is that, if we were continuing to make 80% of the contribution that we make now, then some of the economic arguments about withdrawing and the savings that might bring become much weaker. I think how much funding we continue to contribute would be very much a function of the nature of the deal that we get. If we contribute a very small chunk of funding, then you would expect that the level of influence and the amount of that which is returned to us is very small. I think the other issue would be around mobility, and the nature of the deal we agree on mobility. In order to maintain the competitiveness of the UK science base, we would want something very comparable to the level of mobility that we have now across the EU. Again, the flipside of that is that it undermines some of the arguments for wanting to leave. I think it is very difficult to see a world in which you can have both. You either have to give up some of the mobility, if you believe that is important, but then you also lose competitiveness in science and research, or you retain the mobility, so you retain your competitiveness, but you have not got what feels like one of the qualifying conditions for wanting to leave. My sense, both on the funding side and on the mobility side, is that you can mitigate some of the risks of Brexit, but at the cost of undermining some of the arguments for it.

Viscount Ridley: There are 13 associated countries in Horizon 2020, I believe, i.e. non-EU countries that can participate, and I have to say parenthetically that came as a surprise to me. I am ignorant of these things and, until we started our inquiry, I did not realise this was a programme that applied across Europe and not across the EU; I thought it was an EU

programme. Those countries pay in money and get grants out and, presumably, sometimes sit on the committees that decide research funding priorities. In what sense do they get any differential influence over how those funds are allocated within an EU country? We have been told by the Royal Society that the difference is that they are not on the European Council or the European Parliament, but surely research funding priorities are not set at that high level; they are set much further down within Horizon 2020, are they not? Can somebody clarify that for me?

The Chairman: Dr Galsworthy, would you like to start on that one?

Dr Mike Galsworthy: Certainly. If we were to pull out, then we would no longer have our Government representing us in the Council nor our 73 MEPs. In decision-making, two things are important. One is the legislation around science, which is rapidly changing, and the second is actually the nature and the priorities of the science programme itself. In both of those, there are priorities set initially at the Commission level, listening to all the interests of those around them, which will be prioritised for their members over any external parties. That filters down through the Parliament, which would have to agree to it, in which we would have no representation. If we want to influence those processes, to a degree we have to lobby the lot from outside.

Viscount Ridley: Are you saying that Norway has no influence, for example, in exchange for its contribution?

Dr Mike Galsworthy: It would have less influence outside than it would inside. Either way, for Norway, being mindful that the population is something like 6 million, it is trivial to a degree whether they are in or out.

Viscount Ridley: Forgive me, but there are 12 others—Turkey, Israel and others.

Dr Mike Galsworthy: Yes, and all of them have participation rates on Horizon 2020 of less than 2%, whereas our participation rate is 15-16% and we are very structurally part of it.

Viscount Ridley: So we would have more influence?

Dr Mike Galsworthy: We have a colossal voice at the moment on legislation around science, research and innovation, which is very important, because 62% of our papers produced now are international collaborations, so having cohesive policy with other entities with which we work is very important. Also, in the science programme, because we are such a leading force, we have a very strong say in how things are shaped. The Government itself was bragging about how in Horizon 2020 they helped drive a lot more funds towards small businesses, and then they neglected to have this actually communicated to the small business community, hence our very low levels of participation there. The interests of the remaining countries, should we leave, are going to be towards their own research institutions and their own scientists primarily. We will not be part and parcel of that, so it will cause some awkward dynamics, because of course they will want to work with us, but it is their job to prioritise their own countries and their own research framework over benefiting us, and we would no longer have the protection of being in there.

Viscount Ridley: Who is “they” in this? Is it at the Commission level, the Council level, the Parliament level? Surely, there is a degree of the Haldane principle that goes on in Europe, i.e. scientists set their own priorities for research, and that is where the decisions are mainly taken, and that involves the 13 associated countries.

Dr Mike Galsworthy: I think it would be interesting to investigate further how much influence those 13 countries have, but essentially the degree to which this would be relevant to our scenario is questionable.

The Chairman: We have an opportunity later this morning to ask an associated participant how much influence it has, and we will follow that up.

Lord Maxton: Are those 13 associated countries divided between those who wish to be members of the EU and are applying for membership, and those who do not wish to be members? Is there a division there? I do not know.

Dr Mike Galsworthy: There is an important division because, before the scenario with Switzerland, it was the case that you were either out as a third country or you were in as an associated member. The scenario of Switzerland is the most pertinent to our situation because they had a step-down from an involvement as full as they could, to a lesser scenario. That was based on their referendum where they decided that they were going to have controls on immigration and that put them foul of many deals with the EU. I have here page 8 of a report called *Swiss Participation in European Research Framework Programmes* by the State Secretariat for Education, Research and Innovation. What has happened with Swiss participation from FP7 to Horizon 2020 is a drop in the proportion of Swiss participations from 3.2% to 1.8%, a drop in the proportion of contributions received from 4.2% to 2.2% and, most significantly of all, a drop in the proportion of Swiss co-ordinations from 3.9% to 0.3%. Given that, on Brexit, we would most likely adopt a model that goes back on, or cancels, our freedom of movement arrangements with the EU, the real risk is that Switzerland is a strong precedent for the model that would be used for us. Specifically, the co-ordination of projects, which we are particularly good at, is something that they may wish to retain for themselves, because it then strengthens the hand of their own researchers and research institutions and, when you are a co-ordinator, you are more likely to control the IP, you are more likely to be the lead author on papers and—I believe, but this needs to be checked—you are more likely to call in small businesses from your local environment to participate. There is a strong threat at not only the policy-setting level, but also the leadership level on the ground when we are actually engaging. It is not only about participation. We may be allowed participation, but we might be restricted on co-ordination, which is what happened with Switzerland.

The Chairman: Did Professor Dalgleish or Mr Mian want to come back on this associated membership? Otherwise, we will move on?

Emran Mian: Because our research base is so strong, I think we would still expect to exert a lot of influence when it comes to the peer review of projects and deciding what gets funded through competition. As an associated country, we would still have a large amount of influence on the scientific decision-making, if you like, and that will be a function not only of the strength of our institutions, but the fact that some of our scientists are amongst the leading experts in those fields. I am sceptical that we would lose much influence in that respect, because we are such a big player. I think where we would lose influence undoubtedly is in the wider context in which those decisions get made. For example, when it comes to legislation, medical research, for example, takes place and there is quite a lot of regulation which pertains to medical research, some of which is UK and some of which is at the EU level. I think Professor Dalgleish alluded to some of it in his opening statement.

The reality of being outside the EU may be that, for a project based in the UK to benefit from EU research money, it would have to comply with the EU legislation on medical research, but the UK would not have had any influence on the making of that legislation, so we would still be bound by the rules as an associated country, but we would have much reduced and possibly no influence on the making of them. I think the same would be true when it comes to setting programme priorities within the next framework. Again, within the area of medical research, it may be that the UK has a particular strength, but that strength is perhaps unique to the UK within the EU and we would not expect that particular area then to become a priority in the framework because we would not be around the table negotiating it. You would expect the countries which do have research bases that pertain to other areas of the programme to exert their priorities and for future EU money to be focused on those. I expect we would lose quite a lot of influence on legislation and priority setting, but not when it comes to peer review and the application, if you like, of the Haldane principle.

The Chairman: Professor, did you want to add anything on associated country status?

Professor Dalgleish: I think we would have far more influence if we were outside the EU. We are in a situation of majority voting now, where we are the same as 28 others, and we do not really have that much influence anymore; it has been diluted out and diluted out. If we, the fifth largest nation and a member of NATO, were to be separate from the EU, we would have even more influence on the European Union because they would need us; we would actually end up being more of a leader than the European Union, which I think is going into disarray. I would like to press that point. I think that our impact at the moment is far, far less than it should be and it would be much more if we left.

Q131 Lord Fox: In the event of Brexit, how clearly will there be a difference in the amount of money coming into UK research institutions in that there was money going out from the Exchequer to Europe and then coming back to our institutions? How likely is it that UK Government expenditure on research would compensate for that?

Professor Dalgleish: I personally do not know, but I think they would be under a very strong moral obligation to make up that gap because they would be so much better off overall having so much more money which they are not sending to Europe and never seeing again. I think there will be a tremendous pressure for them to make up that gap and more. On the example given of that institute in Northern Ireland, which I know is really excellent, I do not think you need the EU to do that. That is the British Parliament's job to say that we should actually fund this in Northern Ireland, the way the MRC has funded good units in Glasgow, Edinburgh et cetera, and distributed it around the country. I do not think we need the EU to do that.

Lord Fox: That was not the question really. It was how likely, and you suspect it might be but there is a risk that it will not.

Professor Angus Dalgleish: I cannot possibly say how likely it is, but I think that it would be for a scientist to lobby so that money came back from the Government, because the Government would have more than enough to be able to do it without having to lose elsewhere. I think that would have to make it very likely.

Emran Mian: That is a very hopeful position. In principle, there is no reason why the gap would not be made up. It is a very hopeful position, not least because in the event of Brexit there would be quite significant economic pressure not only on sterling—and the

depreciation of sterling has direct impacts on how research moneys are spent or allocated—but, equally, there would be other economic risks to the UK. It might be that over time those risks would be smoothed out, so if you looked at it over 20 or 30 years the UK might be fine, but the immediate impact would be negative. It is very difficult to see in that negative scenario why science and research would be a priority for the UK.

The Chairman: Dr Galsworthy, do you want to add anything on this one?

Dr Mike Galsworthy: I would concur with the other two that there will be huge pressure to plug the gap financially. Whether that will be taken up, I do not know. It depends entirely on economic circumstances. As has been pointed out, there will likely be lots of other economic fires to put out. The concern would be that the gap is plugged financially, but the overall value of our investments is diminished because our role within this whole ecosystem, which benefits us so well, is hugely reduced. The fear would be that we would be given some compensatory money for the damage done, but the end value would be hugely reduced, and politicians' minds would be elsewhere. I do not believe that we would have money to spare on leaving the EU because, on pulling the plug, there are wider impacts than the 0.5% of GDP, which we count as a net contribution, an amount which might be demanded anyway by the Commission in order for us to continue to play on the science programme, given the fact that it now goes increasingly to shoring up the research and innovation in those other countries that we partner with. The dynamics are complex and very difficult to predict.

The Chairman: Lord Hennessy, Lord Hunt and Lord Ridley all wish to come in on this. I would point out to my colleagues that we are only halfway through the questions, so there is a hint there for you.

Lord Hennessy of Nympsfield: Professor Dalgleish, you used the words "moral obligation". Her Majesty's Treasury, though admirable in so many ways, does not do moral obligation. I think we can all agree on that. It simply cannot abide any notion of hypothecation. If there is a Brexit dividend, there is going to be tremendous competition to grab it. I suspect on the Brexit side of the argument they have spent it at least 10 times already. I think your faith in the moral obligation of Her Majesty's Treasury is touching, but probably deluded.

The Chairman: Shall we take that as a comment rather than a question?

Lord Hunt of Chesterton: Let us carry on.

The Chairman: Thank you for your self-denying ordinance on that. Can we move on to Lord Ridley?

Q132 Viscount Ridley: We have heard a lot about international collaboration. I think Dr Galsworthy cited a figure of 60% of British research being done with international co-authors, or something like that. I believe our biggest co-author/collaborator is the United States of America. How do we square that with the view that European collaboration is vital to continuing international collaboration? Is there not inevitably an opportunity cost in having programmes that specifically discriminate against non-EU countries and in favour of EU ones, so, for example, a scientist might end up spending time at a second-rate conference that happens to be in Europe rather than working with a first-rate colleague who happens to be from Japan, India or America? Is it not inevitable that there is an opportunity cost if you make it much easier to collaborate with one group of countries than with another?

Dr Mike Galsworthy: Not really, for various reasons. First, I think it is hugely useful that within the EU we have a common programme that allows for multinational collaborations and there is a legislative framework to make those easier. In turn, this serves as a catalyst for our capacity to reach around the globe. The size of the programme means that it is comprehensive in subject areas and well-known as a brand—ensuring a certain quality—and therefore, should other countries, such as the US, want to collaborate with the UK, there is a huge channel of potential for doing that through the EU programme, because of all these factors and because you can bring in other partners. I do not believe the expenditure on our participation in the EU, and our closeness with the EU, would be better spent in forging something with America, for example. I think the latter should be encouraged anyway and the EU programme can facilitate any further work that we do with the Anglosphere, or anywhere. I think we should be reaching out to America more and America should be reaching out to us more. However, I do not think doing well with the EU is an opportunity cost in working with anyone else. That does not make any natural sense to me.

Viscount Ridley: So we can have our cake and eat it.

Lord Maxton: What does the USA think about Brexit from Europe?

Dr Mike Galsworthy: From the Americans I have talked to, they think it is pretty nuts.

The Chairman: Did Mr Mian or Professor Dalgleish want to add anything on that? Shall we move on then?

Q133 Baroness Manningham-Buller: I want to talk about the training of the next generation of scientists, which I am sure you all agree is a really important part of the role of the scientist. In particular, Professor Dalgleish, I want to pick up on your statement that the freedom of movement within the EU that we currently enjoy causes British scientists or researchers to abdicate their responsibilities for developing the next generation of scientists, which is quite an interesting observation. What is your evidence for that?

Professor Angus Dalgleish: I think the arguments there were probably due to the fact that when you have people coming from Europe into a laboratory, they come in with European funding and a budget et cetera, and that has a potential negative impact on the mentorship that you would give for somebody who was from your own university.

Baroness Manningham-Buller: Sorry, can I stop you there? You said in your own lab you have a chunk of people from Europe, a chunk of people from other countries and, presumably, a chunk of Brits as well.

Professor Angus Dalgleish: Yes.

Baroness Manningham-Buller: Do you differentiate, according to how they are funded, in how you train and develop them?

Professor Angus Dalgleish: No, we do not.

Baroness Manningham-Buller: So why do you think other people would? I thought you just said it would depend on how they were funded.

Professor Angus Dalgleish: It depends a bit on how they are funded. I have quite a small laboratory, but people with large laboratories are very impacted with regards to the funding, and that dictates how they run their affairs.

Baroness Manningham-Buller: If those foreign students were not getting training and development in British labs, they would not stay; they would not come. I want to have a feel for what the evidence is, because my observation is that in most universities they are being treated as part of the team and equally.

Professor Angus Dalgleish: Yes, I think that is very much the case. In my own laboratory, I do not see any difference between the way that I or the post-docs treat people who have come from Europe and those from home. I do not have this package of funding from the European Union attached to one person who brings it in which has the knock-on effect that is being suggested, so I have no real experience.

Baroness Manningham-Buller: You are not supporting the submission in your statement that the freedom of movement in the EU encourages British science teams to "abdicate responsibility for training the next generation of scientists in their 'home patch'"? You do not stand by that now?

Professor Angus Dalgleish: It has been suggested by some of my colleagues, but I do not feel strongly about that.

Baroness Manningham-Buller: The Committee is trying to gather evidence to make our judgments, but you do not have that evidence?

Professor Angus Dalgleish: No.

Lord Hennessy of Nympsfield: Professor Dalgleish, I have always felt the one thing we can all sign up to, wherever we are on the great European debate, is a belief in intellectual freedom of trade and that the benefits of it are extraordinary. I am an arts and humanities person, but the British students in arts and humanities only benefit from the presence of people from overseas; it raises everybody's game. I thought this is a consensus we could all leap upon and I invite you to do so. You have.

Professor Angus Dalgleish: With regard to having the freedom of movement of people coming to the laboratory?

Lord Hennessy of Nympsfield: This rather mitigates against this statement we have in your colleagues' evidence that it is somehow denying the intellectual base of Brits to have all this collaboration. I think it is quite the reverse, wherever you look, whatever the subject.

Professor Angus Dalgleish: I do not think it denies the Brits. I think that is a misinterpretation of that.

Lord Hennessy of Nympsfield: That is the way I read it, I am afraid to say.

Baroness Manningham-Buller: And I.

The Chairman: Let us move on. Baroness Neville-Jones.

Q134 Baroness Neville-Jones: Could I return to the question of regulation that was touched on in earlier discussion, where I think the statement was made by you, Professor, that the UK might find itself in the event of Brexit not necessarily not having access, but having to obey the regulations under which that research was carried out without having had a voice in them. We have had a lot of evidence that suggests that, on balance, the regulatory harmonisation of the EU has been beneficial to the UK. That does not mean to say that particular regulatory frameworks have not posed problems—they have—but would you agree with the thesis, quite apart from the question of whether we would be obliged to obey

rules that we have not have had a voice in, that the regulatory environment the EU is developing has been broadly beneficial to science? Or do you think it is a mixed picture? I do not know who would like to tackle that. Does it depend on the science? Where does the picture lie?

The Chairman: I see Dr Galsworthy is going to volunteer for that one.

Dr Mike Galsworthy: Very broadly speaking, it is clearly of benefit to common endeavour. There are some areas where there will be tensions—for example, stem cell research—because there are different religious tendencies in different countries. Also, there are some aspects of public health regulation that want to be science driven, such as alcohol, but, because there are very different interests in different countries, even if you asked the Commission to go and legislate on it, it cannot come back with anything coherent so it gives up on it in some areas.

There is other regulation, and I am sure Professor Dalgleish has things to say about this, such as the clinical trials directive, where it is clear that it would be beneficial to have common regulation across a set of many countries so that we can all participate in science and medical research in the same way. However, when that regulation comes in, there can be flaws in the balance of interests. Clearly, we wanted the clinical trials directive to be very heavy on patient protection, for very good reasons, but the impacts of that were felt quite rapidly. It has now been fixed, as far as many people are concerned, by the new version in 2014, which has been praised by various sources, including AllTrials, which liked the transparency that it ushers in, but it had an impact for several years.

Overall, this is clearly the direction that we need to move in. There will be some areas where it is more difficult and some where it is easier, but, as a broad capacity, it is hugely valuable to us all that it is there. If we want common regulation across a vast number of countries, we have a permanent standing mechanism by which we can engage that and then revise it should it need to be revised. I think that is clearly a benefit.

Baroness Neville-Jones: What precisely is the value of having single regulation?

Dr Mike Galsworthy: Efficiency in being able to collaborate and to pool data and effort, so harnessing economies of scale and capacity to involve all countries within the EU.

Baroness Neville-Jones: It is only efficient if it is right though, is it not?

Dr Mike Galsworthy: Yes.

The Chairman: Professor Dalgleish, would you like to comment on this one?

Professor Angus Dalgleish: Yes, I would. My views on the clinical trials directive have already been made known to the Committee. I think it is important to understand the damage that is being done is very largely due to the way it was implemented—like so many directives from the EU—by the British Parliament and Department of Health, without them thinking about its impact. It is yet another EU law of unintended consequences. It has destroyed clinical academic research in this country. My colleague, Professor Morris Brown, has been even more effusive about the impacts of this. The corrections were only after mega, mega lobbying, and it was far too little, far too late.

When I gave evidence to the All-Party Group on Cancer in relation to pancreatic cancer, I pointed out that if you really want to improve the outlook of patients with pancreatic cancer in the United Kingdom, the most important thing you could do was get rid of the constraints

on academic research due to the clinical trials directive, at which point it was suggested by somebody else that perhaps the barriers to entry of the clinical trials directive were at the behest of the big pharmaceutical companies, to keep out the smaller generics. From the reaction, it would appear to be an accepted explanation of why we have been subject to such draconian rules and regulations. At this committee meeting, someone from the audience stood up and said they were Dr So-and-so from a very big Swiss pharmaceutical organisation and that the barriers had been raised so high that even they could not afford to do the trials they would like to do these days. I rest my case with an example of a piece of legislation that has been applied and has done unbelievable damage, which people did not think through.

There is a second one that is terribly relevant, not necessarily for all science but one aspect of science—health sciences—and that is the European working time directive, where they lumped being on call with working. That is an indirect cause of why the doctors are going on strike and why you could never stretch the current workforce to a seven-day week.

Lord Fox: To be clear, your bugbear on the clinical trials is not with the existence of the initial European assertions; it is the way in which those assertions have been applied by the domestic Parliament of the United Kingdom.

Professor Angus Dalgleish: There is an awful lot of truth in that because many of my colleagues have not suffered like I have, because they have mixed and matched and adapted the regulations to the environment appropriately and proportionately. Clinical researchers involved in cell therapy, this, that and the other, were told, "You've started so you can finish", and given a grandfather clause, as it were, and told they could renegotiate when they went in to do other things. We were not even given that. I was told on 1 April, "If you carry on, you will be a criminal". I think that was totally and utterly wrong.

Lord Fox: Thank you. I think that answers my question.

Viscount Ridley: We have heard previously that biotech crops, i.e. genetic modification in agriculture, is one of the areas where a huge amount of beneficial research was stifled by harmonised European regulation and, effectively, something Europe had a lead on vanished and it all went to America. I know it is not any of your specialties, but do any of you want to comment on that particular topic?

Dr Mike Galsworthy: I do. I think that is a particular issue of democracy. In the United States, with genetically modified organisms in foods, you clearly see that the wider public has had huge suspicions about this, but has had little or no opportunity to have its say. There was one stage at which 90% of the American population wanted labelling on foods that contained genetic modification merely for its information. That had been squashed through various mechanisms at various points. Whereas what you have in Europe is large public objection to genetically modified foods finding its way through the European Parliament in order to put restrictions on our science. That is regrettable for the progress of that scientific field, but I do not believe that science should march on, leaving its public behind. I think the real deficit here is in our outreach to, and education of, the public about the real risks and benefits around genetic modification. I do not think that has been done, and that is where the rub lies. I believe that in one of your sessions Kurt Deketelaere was discussing these kinds of issues on the matter of health data and so forth, and the fact that it is not that the Commission itself is seeking to squash science; it is that regulation goes through this democratic mechanism of the European Parliament, and so the other parties who are

interested in the matters being discussed have capacity to make their voices heard. What you are left with at the end of the day is a product of the scientific base engaging with other parts of society when forming regulation.

The Chairman: A final question from Lord Hunt.

Q135 Lord Hunt of Chesterton: From your understanding of the evidence we have received and the wider debate, do you think there are any areas that remain underdeveloped? I would like to add my own tuppenceworth. Having been a scientist and worked on many European projects, I can tell you that as we got more into Europe, what was remarkable about Europe was the efficacy of networks, much more so than with the United States, for example, and the business of handling, storing and making use of data. We have had evidence here in this Committee that, providing there is good organisation, small companies in Britain, and indeed even bigger ones, can make use of the technology and engineering stimulated by the EU programmes. There was some regret that under current arrangements we were not able to make as much use of them as we could. Do you have any comments on those points?

Emran Mian: For me, the most underdeveloped area of the evidence is around researcher mobility. On research funding, there is at least an argument in principle that in the event of an exit the funding gap could be made up. I think it would be very hard to get a commitment to that effect, but, conceptually, you can see it happening. I find it much more difficult to imagine a scenario after exit where researcher mobility is maintained. Some of the arguments have suggested that we already have very good networks across Europe and elsewhere and hence we will be fine. That risks missing the fact that some of these relationships change very quickly, and, of course, the frontier of knowledge changes very quickly, and the researchers who will be important in 10 years' time are not the researchers who might currently be in the UK or currently have associations with UK universities.

The real question is how we would maintain mobility and the making of connections. That feels to me very much like a leap in the dark in the event of exit. For me, the biggest area of hesitation is what would happen to researcher mobility and what impacts that would have.

The Chairman: I think at this point I must draw this session to a conclusion. We have covered a lot of ground. We are most grateful to our three witnesses, Dr Mike Galsworthy, Professor Angus Dalgleish and Mr Emran Mian. Thank you for your help this morning. It has been very enlightening. There will be a transcript circulated. Please make any minor corrections. If there is any further evidence you want to send as a follow-up, feel free to so do, although I would point out that we will be drafting our report fairly rapidly now, so there is not much time. Thank you very much.