

Exiting the European Union Committee

Oral evidence: The progress of the UK's negotiations on EU withdrawal, HC 372

Wednesday 16 May 2018

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Members present: Hilary Benn (Chair); Joanna Cherry; Stephen Crabb; Richard Graham; Peter Grant; Wera Hobhouse; Stephen Kinnock; Jeremy Lefroy; Craig Mackinlay; Seema Malhotra; Mr Pat McFadden; Mr Jacob Rees-Mogg; Emma Reynolds; Stephen Timms; Mr John Whittingdale; Hywel Williams; Sammy Wilson.

Questions 1693 - 1758

Witnesses

I: Dr Sarah Main, Executive Director, Campaign for Science and Engineering; Dr Beth Thompson MBE, Head of Policy (UK and EU), Wellcome Trust; Professor Richard Brook OBE, President, Association for Innovation, Research and Technology Organisations; Professor Michael Arthur, Chair, EU Advisory Group, Russell Group.

Examination of witnesses

Witnesses: Dr Sarah Main, Dr Beth Thompson MBE, Professor Richard Brook OBE and Professor Michael Arthur.

Q1693 **Chair:** First of all, on behalf of the Committee, can I extend a very warm welcome to our witnesses this morning? We are very grateful to you for giving up your valuable time.

We have Dr Sarah Main, executive director from the Campaign for Science and Engineering; Dr Beth Thompson, head of policy, UK and EU, at the Wellcome Trust; Professor Richard Brook, president of the Association for Innovation, Research and Technology Organisations; and Professor Michael Arthur, chair of the EU advisory group for the Russell Group of universities. You are very welcome today.

We have a lot of ground that we want to cover and Members wish to ask



a lot of questions. If you could keep your answers as succinct as possible, that would be great. Do not feel under an obligation for all four of you to answer every question necessarily. In that spirit, I am going to start with a question from me to each of you to kick things off.

Can I begin with you, Dr Thompson? In February, the Wellcome Trust published your recommendations to do with the future partnership. It said, "The EU's framework programmes are the most effective multilateral funding schemes in the world". How concerned are you that here we are, nearly two years on from the referendum, and we still do not know for sure whether we are going to be part of those in future or not?

Dr Thompson: The uncertainty at this time about our future membership of those programmes is very concerning. We are seeing the impact that that is having on the research community. In the UK, they are not sure whether they should be applying for grants in the future, despite the UK Government's helpful underwrite, which takes us up to the end of this programme. What we are really worried about is framework programme 9, which is the programme that comes next and starts in 2021. We are at a really critical time in the development of framework programme 9, because the EU legislation that will shape it is currently being drafted and will be presented by the Commission a little later this year, sometime in June.

It is absolutely critical—it is the foundation of so many of our collaborations and networks in Europe, as well as the actual funding it provides—that we have a very deep relationship after Brexit. It is important to think not only about the funding, but also the way we interact with that programme. We hope the framework programme 9 legislation will enable the UK to do that as an associated country. Perhaps we can come back later to exactly what the technicalities of that are.

Q1694 **Chair:** Indeed, I hope we can do that. Thank you very much for that. On one of the points Dr Thompson just raised, Professor Arthur, the Russell Group has said, "There is no guarantee that, if the EU source of investment was removed, it could be replaced with funding from national budgets and sustained long term". Does that continue to be a concern for you?

Professor Arthur: Yes, very much so. Obviously, the money could be repatriated and reinvested in science in this country. The question is whether it would achieve the same. In our view, to the statement you made at the beginning, this is the best international set-up for funding research across multiple borders in the world. That is absolutely the case. If we are not part of that, we are in significant difficulty in terms of our international excellence in the future. It is a really, really important issue—to try to keep access.

The other element of it, of course, is the European Research Council, which is a major agency for bringing talent to this country. At University



College London, we are about to celebrate the 200th award. If you look at that across the Russell Group, it is a couple of thousand ERC fellows. That brings talent predominantly from Europe to the UK. It funds some UK scientific excellence and it brings some others from around the world as well, but that supply of European talent into the UK science base is critical.

Q1695 Chair: Thank you very much. On that point, Dr Main, how important is continued access to that talent, skill and scientific research expertise to the future of science and research in the UK after we have left the European Union? Are you concerned about how that is going to work in future?

Dr Main: The Campaign for Science and Engineering represents a really wide variety of different types of organisation that do research and innovation. Across all of those, whether they are businesses, research charities or universities, access to talent is the No. 1 priority. Absolutely there is broad concern across the sector that research-led organisations of a wide variety of types about the ability to access that talent when they need it.

We can perhaps come back to this, but today the Campaign for Science and Engineering is going to publish some figures that have been provided by the Home Office on the impact of the tier 2 cap on skilled workers, which I can talk more about later if you wish. For STEM-related roles, including medical, engineering and tech roles, we are now seeing numbers in the thousands being refused visas due to this cap. The reason I mention that is because a future partnership with the EU will presumably require an immigration system to match, one which we would want to see supporting research and innovation.

The domestic immigration system at the moment needs to be addressed, because this situation is becoming quite urgent. Any future system that is developed must work to support the UK's fantastic research and innovation environment.

Q1696 Chair: There are currently roles that need to be undertaken and cannot be, because of the impact of the cap. Is that what you are saying?

Dr Main: Yes. A cap exists for non-EU workers who have a job offer. This is where employers in the UK have sought to recruit from the UK and have been unable to. They are then allowed to apply for a certificate of sponsorship to recruit someone from outside the EU. There is a cap on that per month, which has now been exceeded for the last four months, and the numbers are rising.

Therefore, because the cap has been exceeded, there are a number of refusals—the visas are refused not on any grounds of technicality that a person should be rejected, but simply because the cap has been exceeded. We have now obtained the details of the roles and the definitions of the jobs for which those visas have been refused. We see



HOUSE OF COMMONS

this balance that I mentioned to you. A high proportion of those are in roles related to science, technology, engineering and medicine. There are a number of others in professional business roles as well.

Q1697 **Chair:** After we have left the European Union, that cap could be applied to EU researchers and scientists as well. You would presumably be even more concerned if that were the case.

Dr Main: Yes. The clear message we receive from businesses, universities and all kinds of organisations that do research and innovation in this country is that, in any future system, organisations have to be able to access the talent they need in a proportionate way. It has to be feasible to navigate the administrative process; it has to be feasible to attract the talent you need; and it has to be proportionate.

A cap like this is quite burdensome and frustrating. It is having a damaging effect on those people and those particular roles but also on business confidence overall. No, we would not want to see this extended in any future system.

Q1698 **Chair:** That is very clear. Thank you very much. Finally from me to you, Professor Brook, in the correspondence you had with the then Minister of State for Universities, Jo Johnson, you drew attention to discrimination taking place in agri-tech, space and satellites.

Professor Brook: Yes.

Q1699 **Chair:** This was in advance of actually leaving the European Union. We took some evidence last week on Galileo, which is the most famous example at the moment. Could you give us a little more information about how that is working and what concerns you about it?

Professor Brook: The Commission is working to reduce its reliance on UK resources following Brexit. There are a number of areas where UK organisations, because of their uniqueness of capability, are contracted by the Commission to provide research to it. The example I was talking about in the correspondence is the National Institute of Agricultural Botany. It has already had contracts terminated without notice or consultation on the basis that that work, following March 2019, will be required to be done in one of the 27 EU member states. We are already seeing contracts being withdrawn or not offered to UK companies, despite the fact that we are still a member of the EU.

There is anecdotal evidence of this happening to a number of other organisations. It is a similar situation to Galileo in the sense that the contracts I am talking about are not grant-supported R&D—this is procurement of research or development from UK organisations to contribute to European infrastructure. We are beginning to be denied those opportunities.

Q1700 **Chair:** If that does not change, what are the implications right across the piece?



Professor Brook: The implications are that we will have lost the capability by the time we get to the point of leaving the EU. The concern is that the damage is being done now. We are losing jobs. A number of our member organisations have already set up operations in France, Germany or Ireland in order to have a presence in the EU. Therefore, work that would have been done in the UK is now being done outside the UK. Unless we get cast iron agreements very soon as to how we are going to proceed, that will have happened anyway by the time we get to leave the EU. The UK will have lost jobs and capability.

Chair: That is very clear. Thank you very much.

Q1701 **Jeremy Lefroy:** Can I declare an interest? I am a member of the board of the Liverpool School of Tropical Medicine.

Can I follow on from what the Chair was talking about in terms of future immigration policy? Can I ask how much the scientific and research community has been able to feed in views on future immigration policy to the Government, given that a Bill is supposed to be coming forward later this year?

Professor Brook: We have submitted evidence to the Migration Advisory Committee after some extensive discussion with our membership. We have had the opportunity to feed in views. I am not sure we have had much feedback. We remain concerned about the visa regime that may follow this. I would support the comments that have already been made about caps and the ability to recruit, particularly in light of the fact that applications from EU nationals to fill vacancies in our sector have declined dramatically. We are not getting the applications from EU nationals and, therefore, we are going out and being more dependent on the rest of the world. A lot of the skills we require are below PhD level; they will be masters level and experienced first-degree candidates. A cap applied to them would be pretty disastrous.

Q1702 **Jeremy Lefroy:** I will come on to others, but can I just ask a specific question? Is the fact that caps may be related presently or in future to salary levels a problem, given that a lot of these really important jobs at masters, doctorate or post-doctorate level are often not that well paid, but contribute huge amounts in terms of capability?

Dr Main: To your first point, the consultations of the Migration Advisory Committee have been very welcome. A wide number of research-led organisations have contributed to that consultation, and that is welcome. Through the Science Minister's high-level stakeholder working group on EU exit, universities, research and innovation, a number of issues around talent have been raised, and we would hope that some of those messages find their way through to the Home Office.

On the specific point of the cap and the salary levels, there is a system in place whereby, when the cap is exceeded, priority is afforded to certain roles, and there is a points system associated with it. One of the criteria of the points system is salary. As demand increases, the salary threshold



HOUSE OF COMMONS

also rises. We are seeing that salary threshold at the moment hovering around £50,000 a year or something like that. That excludes a wide range of roles in the NHS, many engineering and tech roles and also across much of business. That will also have differential effects across the whole of the country, where salary levels will vary.

On behalf of the Government, the Migration Advisory Committee has a shortage occupation list where the Government recognise the shortages that exist in the UK. They afford those roles some priority in the points system for this cap. Our recommendation to relieve the pressure building up on this cap is that those shortage occupation roles should be exempt from the cap. If they were made exempt from the cap, that would create enough headroom for the cap to operate effectively for the wide range of business roles that are processed through it.

Dr Thompson: Looking ahead to the immigration system after we leave the EU and what that means for our sector, we have found that people are listening and we look forward to seeing whether our comments as a sector have been taken into account. There have been some improvements in the current visa systems—we have been pleased to see things like the paths to permanent residency made easier. That suggests that people within the Home Office and elsewhere are listening and recognising the importance of mobility in the sector.

Moving on from the cap and tier 2, the point you have picked up on qualifications and salary is really important. The current system uses those things as a proxy for skill in a way that is simply not appropriate. That would be our concern. If that current rest-of-world system was rolled out for EEA workers in our sector after Brexit, we think that would be very damaging. We need to find an alternative system that would work for those workers.

Q1703 **Jeremy Lefroy:** But the point you make is that the system is not fit for purpose, whether it is EEA nationals or nationals from the rest of the world, because the salary levels are not a proxy for abilities and contributions in the academic world. Is that correct?

Professor Arthur: This lies at the absolute crux of our future relationship with Europe in science, research and education. At the moment, there is free mobility. What will the arrangement be? What will the expectations be on the level and ease of mobility? If you want research to work properly and to the nation's future benefit, that needs to be relatively straightforward, less bureaucratic and not founded on issues like salary. The other point I would make on salary is about recruiting highly specialised technical staff from Europe, usually at a relatively low salary. There are visa issues there. This is crucial.

You asked the question about whether we have had input. The Russell Group have had regular meetings with the Home Office, going back a decade or more. We are definitely being seen and we are being listened to. Rather like what has already been said, we do not yet know how



effective that is going to be and what the final outcome will be. This is a really critical issue—and I am sure we can come to some other critical issues—about what future mobility looks like for European nationals, particularly those in the early stages of their career.

This is what I lose sleep about: the pipeline of talent into the country's scientific base, as exemplified in my case by being a major university. There is a ready supply of talent that comes to this country at PhD student stage or early career researcher stage, many of whom stay on and make their careers here. They have been able to do that in the full knowledge that, as European citizens, they have full rights in this country. What does that future look like for them? If you were one of those individuals, would you make the decision to leave your home country and come to the UK if there was uncertainty? The more we can unblock that uncertainty, the better it will be for keeping our scientific excellence where it currently is.

Q1704 Jeremy Lefroy: Thank you very much indeed. I will ask one final question that you may have one or two comments on. Is there any contingency planning in place in the higher education sector in case of a no-deal situation next March?

Professor Arthur: I am happy to talk about that. I have a meeting on this later today. We call it the Brexit mitigation group. We have met nearly 40 times now as a committee at UCL. We are thinking about all aspects of this: the rights of European citizens, future student recruitment, research and what we would do. We have tried to mitigate as much as possible, but we are still dealing with lots of uncertainty, so it is very difficult to mitigate effectively when you are not quite sure what is going to happen.

Dr Main: Coming from a business perspective, what we hear from businesses involved in research and innovation is very much the same. They take a business-risk approach to mitigating the risks of Brexit and they also have contingencies in place.

As I am sure you will have heard from many other businesses that have given evidence to you, a range of actions are being undertaken by scientific businesses now, including either shifting the balance of activity on to mainland Europe or establishing new bases. But we hear of a whole range of different mitigating activities that are going on in the business sector as well as the academic sector, as you have heard.

Q1705 Emma Reynolds: Following on from that, Professor Arthur, if this uncertainty remains, and if indeed the worst-case scenario that we have talked about, with caps on the visas, is brought into place for EU nationals as well as non-EU nationals, what kind of impact will that have on UK universities?

Professor Arthur: All universities that are world-leading in their profile, education and research rely heavily on the supply of the best talent in the



HOUSE OF COMMONS

world. When I advertise for early-career researchers or academic posts, it is literally open to the talent of the world to apply. At the highest level, we sometimes try to seek out the very best individuals to come and join us. The immediate answer to your question is that I can no longer be certain that I can get the best in the world because of a set of rules that have now changed. Therefore, the impact of it would be pretty significant.

My worry is that it will not be an overnight thing; it will be quite insidious in its onset. In 20 years' time, instead of being second in the world to the United States of America, I am worried that we will be 20th or so. We will sit there asking, "How did that happen?", and part of it will be the insidious onset of this inability to recruit the world's greatest talent, including, of course—let me be clear—a very large number from the UK. We are not just about international recruitment; we are about "and"—we want European, international and UK talent. It is only when you have access to that whole pool of talent that you can really build an institution of significant calibre.

Q1706 Emma Reynolds: Relating to that, if in the worst-case scenario our own nationals were not able to go to other EU countries in the same way as they do now, what would be the impact of that on UK science and innovation, given the collaboration that exists? Many British people go to study and work abroad, and then come home.

Dr Main: Could I offer a number to illustrate the point you have just raised there? We have data that says 72% of UK-based scientists spent time at non-UK institutions over the period from 1996 to 2015. That gives you a numeric illustration of the fact that this kind of mobility is an inherent part of research and innovation, as you might imagine. In some ways, the needs of the science and innovation sector have parallels across other business sectors. In some ways, there are parallels about access to talent in any other business sector you might speak to. There are some distinctive characteristics, and this is one of them. There is a lot of short-term, flexible mobility built into the research system for short-term exchanges and a whole variety of things.

For example, there is an issue around indefinite leave to remain. Under the criteria for that, there is a fixed number of days that someone is allowed to spend abroad and retain their EU citizenship. We have seen problems with that visa regulation for some researchers and scientists. They now find that, because they are doing fieldwork abroad, they fall outside of those regimes. I would commend to the Committee noting some of the distinctive characteristics of the research environment that give us this strength in the UK, including the value of UK-based scientists being able to move abroad as well as others coming here, and the value of supporting this flexible and short-term collaboration for research purposes.

One other angle, from more of a business perspective, is that there is a strong entrepreneurial science and innovation sector in the UK. That



needs to be well supported by any future system. Thirty percent of London tech start-up founders were born overseas. Someone who wants to come here might be a future London tech start-up founder. We would need to be able to provide for their needs in a future migration system if we wanted to encourage and allow that element of our economy to thrive. At the moment, that would not really be supported. An entrepreneur might come here and fall out of the visa options currently on the table.

Professor Brook: The mobility is very important for small companies in particular. In the sectors I am familiar with, small companies being grown by an entrepreneur have a disproportionate number of non-UK staff and EU nationals. If their supply of talent is constrained, it will hold back their growth. In career development terms, the ability to easily send people overseas helps develop a global outlook. It helps encourage diversity of thought and approach. We would be at risk of losing quite a number of those characteristics.

Also, the mobility is a factor in attracting inward investment to this country. Multinationals, for example, invest and locate in the UK knowing that they can send their staff freely around Europe. That is one thing that attracts them to the UK. A number of soft factors—if you can call them that—would suffer from constrained mobility.

Q1707 **Mr Whittingdale:** Can I come back to the question raised by the Chair, based on the evidence we took last week about the Galileo project? We were told that, despite a willingness and indeed a desire for the UK to continue to participate in Galileo, it was not possible. I wonder whether you have had any suggestion that the same attitude might be taken in relation to the UK's willingness to continue to participate in programmes for collaborative research across Europe, like Erasmus, in that we are not allowed to pick and choose which programmes we would like to take part in.

Professor Brook: What I do when I am not doing AIRTO is in the space sector, so I am reasonably close to the Galileo situation. This is where the European Commission is procuring infrastructure. It is not grant-supported collaboration; it is a procurement contract. There are particular issues associated with access to classified information post-Brexit and the defence and security situation.

Where the EU is procuring research, development or equipment from the UK via a non-EU agency like ESA, we could expect to see the same constraints being imposed. In addition to Galileo, there is a programme called Copernicus, which is the earth observation programme. That is not tied up with security issues, but we are beginning to see the same clauses being put into contracts for Copernicus, whereby the Commission seems to be trying to reduce reliance on the UK for its future programmes.



HOUSE OF COMMONS

I would expect to see the same constraints being rolled out elsewhere. One might ask about other programmes, but I am not an expert in the particular programmes elsewhere outside space.

Q1708 Mr Whittingdale: I would like to follow up on procurement but, before I do, do I therefore take it from that answer that there is no indication you have seen that there might be resistance to the UK's continued participation in cross-Europe collaborative projects?

Professor Brook: Security and defence is possibly a special case. We do not have enough evidence to know whether there will be a blanket application outside that area.

I should have explained that our members cover public sector research laboratories, national labs like NPL and NNL, Catapult centres and independent companies limited by guarantee. A number of those are notified bodies under the current European arrangements for CE marking and for providing evidence of compliance with regulation and standards. As of March 2019, they will lose that notified-body status if they are located in the UK, and results of work they do will not be accepted elsewhere in Europe, and vice versa. Unless agreement is reached, UK manufacturers and suppliers of products will have to send their products into an EU member state to have the marking and testing done.

Dr Main: I wondered whether I could address your other point, about whether similar effects have been seen elsewhere. There is some evidence beginning to show about a reduction in UK involvement in awards. One of the problems is that we would expect a bit of a time lag in seeing that data coming through. One might imagine that, if there was reluctance from an EU researcher's point of view to approach a UK partner, that would take time to flow through into actually seeing a drop in UK participation in major projects. But we are beginning to see that.

In 2017, the UK's total share of the Horizon 2020 funding, the framework programme funding, and its share of project leads, reduced. The proportion of projects in which the UK is the lead is really important, because the lead participant tends to get the lion's share of both the responsibility and leadership, and the funding award. From a business point of view, we have seen that the UK business share in Horizon 2020 has fallen in the year to September 2017. It fell from 12.4% to 11.1%. It dropped from being the second highest recipient, behind Germany, to the fifth.

Q1709 Mr Whittingdale: Might that be because there is a present uncertainty about the UK's future position within Horizon?

Dr Main: Yes, I am sure that uncertainty plays on the minds of people who are approaching collaborators. I will let the rest of the panel comment, but providing assurances as early as possible about how these collaborative programmes will operate and the eligibility of the UK within them will be very useful and welcome.



HOUSE OF COMMONS

Professor Arthur: Some of our staff have been asked to stand down from the leadership position on network programmes. It is reasonably understandable, in that of course a lot of work goes into these networks. A lot of money goes into preparing the network applications as well. The assumption by one's collaborators is that, if it has a UK lead, it might stand less of a chance and also, if the grant is awarded, there might be a sudden difficult moment where we can no longer be in the lead and everything has to be transferred, so people have been moving the leadership away from UK-based principal investigators to other members of the network.

Dr Thompson: If I could tie that together briefly, there is an important point here. Lots of this stems from a perception of risk by collaborators and people in the UK about whether it is worth their while to apply, but we have a fair amount of certainty up until the end of 2020. This risk is still filtering down into a negative perception and people are not necessarily applying. Therefore, it is absolutely critical that we get certainty on framework programme 9 and what happens next as soon as possible. It is going to be difficult to do that at legal level, but we need to have a clear political path towards that agreement as soon as we can.

Q1710 **Mr Whittingdale:** Can I ask a separate question, which is probably for Professor Arthur? At the moment under the EU requirements, EU students are able to pay the same level of tuition fees as UK-based students. That will no longer necessarily be the case afterwards. Given the very high level of international demand for places at UK universities, do you know whether, or do you think, universities in the UK will charge international fee rates to EU nationals once we are no longer part of the EU?

Professor Arthur: My understanding of the legal advice is that the treaty currently provides us the air cover to charge the same fee for EU students that we do for home, and charge a different fee for international. If we are no longer a member of the EU and no longer covered by that treaty, to charge different prices to different nationalities on the basis of nationality would be discriminatory or could be judged to be discriminatory. Therefore, we would most likely have to charge EU students the same fee as we currently charge international students.

In some parts of the university, this is a huge problem, particularly in the School of European Languages, Culture and Society, which is about 70% EU. Those EU students provide a lot of the intellectual background and ethos of the department. There, we would consider for academic reasons whether or not an appropriate bursary could be applied. But my understanding is that that would be legally testable. It is quite a complex and difficult area.

The impact of all this on student numbers from the EU is obviously something we have been thinking about and trying to mitigate. I assume that numbers under those circumstances would fall, but precisely how far they would fall is currently unclear. It is kind of interesting. In the midst



HOUSE OF COMMONS

of a crisis, you find out things about your institution that you did not previously know. It turns out that only 30% of students from France, Germany, Italy, Spain and Greece—the five biggest providers of EU students to UCL—take out student loans, while 70% just pay. It is the reverse, by the way, for the EU13 countries: 70% take out the loan in the EU13 and 30% pay.

Not surprisingly, we have been gearing our marketing up to those countries that already have a high rate of paying. We have been marketing much harder to students from the EU than we have ever done before as part of our mitigation for what might happen, but it is a deep concern because of its unpredictability.

It is very different in different universities even within the Russell Group, by the way. At the moment, my EU applications for this year have rocketed by another 15%, which is the complete opposite of what I was expecting to happen. Presumably people are knocking on the door of the last chance saloon—I am not sure—but elsewhere in the sector numbers are down. This will have quite a differential effect across the sector.

Q1711 Mr Whittingdale: Is it not the case that the reason international students want to come and study in the UK is that we have some of the best universities in the world? Should your sector not be looking forward to this as an opportunity to obtain additional revenue, not just from Chinese students but from right across Europe and beyond? The demand for universities, as you have suggested, is not being influenced in a downward direction. It will continue to be maintained for as long as you offer the quality of university education that you do.

Professor Arthur: There is absolutely no doubt that we are very competitive internationally for students. We are highly attractive. My international student rate has shot up by 22% for applications this year, so it is a very buoyant market. We need to be careful. A lot of that is China. In our strategy, we are diversifying away from China and into as many other countries as we can. European students add a lot to UCL. In one fell swoop, they add 28 different cultures. If you are a university that is trying to be highly creative, having access to that level of diversity is critically important. For us, it is an “and”; it is not an “instead of”.

Where will we end up financially? You are absolutely right: we may not be in too much trouble, but the university will have changed a lot. It will have attracted wealthy individuals from across the globe who can afford to come, instead of the broad social dynamic of UCL as we know it today with its heavy European influence, which to my mind is one of the great features of UK higher education.

Q1712 Mr Whittingdale: You will be able to choose the criteria on which you admit students. If you regard it as important to maintain that wide cross-section, you can do so.



Professor Arthur: Providing I do not fall foul of the laws of the land, absolutely.

Dr Main: Can I just add a broader perspective? CaSE represents about 50 different universities. From a broader perspective, given the question and answer you have just heard, the Committee might want to consider the impact of this on, for example, the industrial strategy agenda and the agenda of sharing the proceeds of productivity, and sharing benefits and prosperity, across the whole of the UK.

The thing we do know is that the predicted impacts of, for example, EU students or EU funding, are really quite lumpy. Various studies have shown that they will have differentially larger impacts in certain disciplines, in certain areas of the country and in certain institutions. A number of outstanding universities will be affected, as Professor Arthur has said, even among the Russell Group, in slightly different ways. But across the whole UK, universities are part of the agenda of productivity and growth in a more regional way. Some of those universities are likely to be very disproportionately affected by some of these issues.

Q1713 **Stephen Timms:** Can I put a question first to Dr Thompson? The Wellcome Trust has made the point previously that there is “an inherent lack of dynamism” in EU regulation. I think we understand what that means. Are there aspects of EU regulation and policy in this area that the sector would like to see some divergence from in the future? Do opportunities come from escaping this current un-dynamic environment?

Dr Thompson: Through our work on Brexit and particularly the Future Partnership Project, where we consulted with over 200 organisations, we have looked extensively at the regulation that particularly affects our sector, which is research within the life sciences. We have not identified any particular bits of EU legislation or policies that we would diverge from. In particular, looking at things like the data protection laws, which I know you took evidence on last week, clinical trials legislation and the use of animals in research, we have found very good reasons to continue to harmonise with those EU frameworks, not least because the UK was able to play a strong role in shaping those. Although it has sometimes taken a long time to get to that point, there are robust pieces of legislation that really help the way we do research.

There are particular advantages to harmonising on things like data flows to make sure we can manage the important exchange of personal data that is critical for research as well as other sectors. In clinical trials, our population in the UK is not big enough to sustain very large-scale trials—we do not have enough patients with rare diseases in order to host trials as a single country on our own. There are real benefits to having an aligned regulatory framework with another sizeable economy so that we can collaborate more easily through research.

Having said that, to address your point on dynamism, the UK has a very strong track record of pragmatic and proportionate regulation in the



HOUSE OF COMMONS

areas that have been a member state competence while we have been a member of the EU. I am thinking of things like mitochondria donation, where the UK has taken a very progressive position internationally in terms of allowing a new IVF technique to prevent the transmission of a devastating and life-shortening disease. But we have done that in a way that is robust and rigorous, and engages the public.

We can learn from those lessons and look at where the UK can regulate better, perhaps in these new technologies where the EU will perhaps not get off the ground with its legislation as quickly in the future. In those cases, there may be a good case for UK regulation or governance, which could create a strong advantage in the UK for both research and the technologies and industries that rely on those sectors. That is something we are going to spend the second half of this year looking into. There are opportunities to take, but those do not come from diverging with EU legislation as it stands currently.

Q1714 Stephen Timms: You are saying the opportunities might arise in areas where the EU just has not got around to regulating so far, where we could do something ahead of the rest.

Dr Thompson: Yes. We have done some of that already as a member of the EU. That potentially becomes a clearer opportunity outside the EU. There may be more appetite to build on that opportunity than we have had in the past.

Q1715 Stephen Timms: Is there anybody else who wants to comment on this? Are there opportunities in divergence?

Professor Brook: In my sector, state aid rules, and certainly our interpretation of the state aid rules in the UK, can often get in the way of assisting small companies and entrepreneurs, for example. There are some constraints, but on the other hand we have to recognise that, even if we were not under EU state aid rules, the WTO also has state aid rules. Whatever you are adopting as the regulation for trade, there are going to be things that we will have to compromise on, but the state aid rules are the main thing that comes up from my sector.

In terms of all the regulations that apply to product certification, particularly where public safety is concerned, we would like to see things remain converged. If they start to diverge, it means manufacturers and suppliers of products will have to target two different sets of regulations and may have to duplicate the testing of their products. Mutual recognition agreements are needed to get round that problem.

Dr Main: I would agree entirely with what Dr Thompson said. The clearest message we hear is that a stable regulatory environment is very important for supporting all kinds of research and innovation endeavours, whether that is aerospace, pharmaceuticals or academic research. It needs to facilitate trade, access to markets and innovation. Stability and harmonisation are desired.



HOUSE OF COMMONS

To add a phrase to what Dr Thompson said on the point of divergence, there is the concept of the innovation principle. You might be familiar with the precautionary principle that the EU applies to regulation, which is an assessment of risk. A number of organisations and companies have suggested that it would be perhaps beneficial to consider alongside that an innovation principle, which looks at the opportunities of the innovation alongside the risk.

Some work has been done on that and some suggestions have been made, which I could share with the Committee. But that gives a framework to some of what Dr Thompson was saying about how the UK might be able to build on its really outstanding track record of regulating in a fast moving, evolving scientific landscape, and doing so with robust dialogue with the public, ethical consideration and a great deal of scientific evidence and input.

Professor Arthur: I would like to give you a quote from Sir John Bell in his *Life Sciences Industrial Strategy* paper. "Relatively speaking, the UK market is too small even with the fastest and most innovative regulatory system in the world to stand alone from a larger decision-making bloc". Any improvements or changes in regulation need to be balanced against the impacts of our wider co-operation with the EU. He is thinking there about life sciences and biomed activity. Be careful what you wish for and think about the long-term downstream consequences of regulatory change.

Q1716 **Stephen Timms:** Dr Thompson, you made the point about there being opportunities in areas that the EU has not yet regulated. Presumably we can do that already, can we? Will there be any additional opportunities once we are outside the EU in that space or not?

Dr Thompson: That is hard to say until we see what the final agreement looks like. But you are entirely right that, as a full member of the EU, we have that ability now for many of those new technologies. It may be that we end up with a final trade agreement that gives us a bit more flexibility, in which case there could potentially some areas where we do not have competence at the moment but we would completely free to regulate in after the deal. It is hard to say, but that opportunity is largely there as we speak.

Q1717 **Wera Hobhouse:** First of all, can I declare an interest? I am a member of the court of Bath University, which is very much a science and engineering-based university. I know that a lot of students come from non-EU countries, but the university is particularly worried about the effects of Brexit on staff retention. Throughout the session, we have already heard that you are worried that we will not attract as many students and staff from the EU, but you cannot really put a concrete number on that yet, or can you, Professor Arthur?

Professor Arthur: We cannot yet put a concrete number on the change in student numbers, because we are still effectively operating under the



HOUSE OF COMMONS

previous regime. We hopefully will continue to do so for 2019-20 entry. We are waiting for the Government to tell us what the funding and fees regime will be for EU students for that period. On the staff side, we have all noticed a decrease in applications, particularly for early-career research opportunities. Those are in effect the starter jobs, the way into becoming a lecturer, senior lecturer or professor and contributing to science in this country.

Some of what we have noticed has been quite shocking. For example, we have a scheme of excellence fellowships at UCL. This is a way of attracting the very best from around the world to give them a start in life, and it prepares them for their first major fellowship application to the Wellcome Trust, the ERC or whoever. Usually we would have about 120 to 150 applications, and we would expect 30% to be from other EU institutions. I am choosing my words carefully, because some Europeans who are already in the UK also apply. This year we had zero applications from other EU institutions. I have another example, which is a major award from the Engineering and Physical Sciences Research Council—the EPSRC. A very prestigious fellowship was available, attached to a major grant at UCL, and there were no applicants from Europe.

Further up the staff chain, I got my HR department to look at EU applications for all posts. Usually, around 25% of all applications would be from EU citizens. That has dropped to 20%. Of course, we are still able to fill the posts with very good people, but that is just a measure of the change. We are not seeing a major exodus, certainly not from UCL. That is the report I get from around the Russell Group. There is a bit of turnover. Of course, some Europeans go back to their home countries in Europe. But so far we have not seen the mass exodus that everyone was a bit worried about. It is early days, but the early signs are worrying, particularly in that younger age group, who are the pipeline of talent I talked about earlier.

Professor Brook: For our community, the number of EU nationals returning has gone up slightly since the referendum but not terribly significantly. EU nationals on the staff have been very concerned about their future. They have expressed a lot of worry to management, and our members have been taking special care to try to reassure them and indeed help with any residency or immigration issues they have.

The worry has been the fall-off in applications from EU nationals for vacancies, which are very significantly down. I cannot give you a number, but they are very significantly down. That also goes up to the more experienced staff. The vacancies that are hardest to fill in our sector are for people with specialist technical knowledge, but also maybe five to 10 years' experience, who have some capability in management. They can take a year or even two years to fill. The loss of applications from European nationals into those posts is a serious worry.

Q1718 **Wera Hobhouse:** You cannot easily go further afield and see whether



HOUSE OF COMMONS

you can fill these posts internationally.

Professor Brook: We try, but in very specialist areas the pool of really good talent in the UK alone or even in Europe is quite small. You are fishing in quite a small pool. But we try to recruit worldwide, except when there are any specific reasons not to go for a particular country. It is just that any reduction in the pool of talent we are looking at is a concern.

Dr Thompson: If I can give you a funder's perspective, over the last year around 28% of our personal awards went to non-UK EEA nationals, compared to around 11% from the rest of the world. There may be a number of reasons as to why we are funding more EEA nationals. That is partly about how the strength of research is within those countries; it is partly about the geography, the proximity and the strength of our existing scientific relationships. But we have seen very similar trends to Professor Arthur in terms of declining applications. We have had people who have already applied and have been given an award who have turned that funding down because they do not want to come and work in the UK.

We also have more quantitative data. In 2017, the Wellcome Trust Sanger Institute, which is our centre near Cambridge that sequenced a third of the human genome, had a 50% drop-off in non-UK EEA applicants to its PhD scheme. Similarly, within Wellcome we have seen a reduction for some of our early-career schemes. It is not as dramatic as 50%, but there has been a 14% fall in applications from those non-UK EEA countries. The important thing to bear in mind is that this is before anything has actually changed yet.

Q1719 **Wera Hobhouse:** Can I very, very quickly ask something about Horizon 2020, which was mentioned before? Horizon 2020 is running out anyway. Is the worry not much more about the follow-up programmes? We do not really know what the EU is doing.

Professor Arthur: It is absolutely the worry. By the way, it is great that we managed to secure the funding to finish off Horizon 2020, and we are extremely grateful for that. Framework programme 9, which is now called Horizon Europe, is being designed right now. At the moment, we are part of that design. I was in Brussels yesterday talking to the British team that involved. That is good, but of course, as soon as we get to next March, we are not at the table at all. Yet, at the end of the transition period or somewhere in the transition period, we hope to have an ongoing agreement about science, research and innovation within the remaining EU 27.

It would be nice if we could bridge that gap to when we have the agreement with some ongoing involvement in the design, but my understanding is that that can happen only if we are invited by the EU 27 to continue being part of the discussion. We have no right to be there following the Brexit date in March 2019. That gap is crucial.



HOUSE OF COMMONS

The other reason it is crucial is because of what happens once you drop off the perch of involvement. There is a perfectly worked experiment called Switzerland. In the view of the rectors and university associations in Switzerland, when they were no longer able to do that, it was not just the two years they were missing from the programme; it was all the time it took them to re-establish themselves, having missed out on the start of the programme. It is really, really important that we try to go from being involved to being invited to being re-involved, without a gap, if one can be avoided. That would be crucial.

Dr Main: I have a tiny point, tying back together what you have heard on application drop-offs and this question of whether we are in framework programme 9. I would recommend that the Committee considers the impact of the UK's messaging to the rest of the world and how important that is. The messages we send out—both the technical reassurances and our encouragement and openness to attract these kinds of applicants where we are seeing fall-off—are really important. They are heard very clearly across the global science and research community.

Q1720 Craig Mackinlay: A lot of what you have described has been annoyances and frustrations with the immigration system and inflexibility in the Home Office. There is no interference at all with EU students, technical people and qualified academics, but you have a problem with the rest of the world, because that is where a very money-based system rather than a skills-based system comes to apply. We will have to see in future legislation how that might be addressed. I, for one, feel that skills should be given a high ranking along with money, so that the availability of the international pool of talent to the UK is increased.

But my question is really on collaboration. If I had just listened to what you have said in isolation, I would almost believe that we only ever do collaboration with the EU, and I know that is not true. We are forgetting that the US has some fantastic universities.

I just pulled out earlier today *The Times* higher education ranking for 2018. I have no doubt there are a load of different rankings, but I will just pick on that one. Oxford is first in the world; Cambridge is second. US universities occupy third to seventh. Imperial comes in at eight, which is in the UK. Ninth is the University of Chicago in the United States; 10th is the Swiss; UCL comes in at 16th; 27th is Edinburgh. We have to go all the way down to 34th before we find an EU university. They are generally 60-plus in the global rankings.

Would it be reasonable to say that the flows of skills are more from the EU to the UK, or are they matched either way? If we look at the UK and the US, which we have not identified here, I would guess that there are probably more flows from the UK to the US than there are from the US to the UK, because people are chasing excellence. Would it be fair to say there are more flows of EU to UK than there are UK academics going to the EU, because of that pursuit of excellence?

Collaboration, to me, is like global free trade. Everybody rises with the



tide. It is a good thing. How does that all fit in with your thoughts? Dr Thompson, you have said a lot about skills and the problems with the immigration system.

Dr Thompson: There is no doubt that our collaboration within science is global. It is not restricted to UK-EU. Science needs and thrives on great people who have great ideas. It does not matter where they come from in practice. What we do know is that the UK has some particularly close relationships with the EU. The way the EU funding programmes work is that Switzerland and Norway—other non-EU countries—are part of that. It is probably more helpful to think about the whole European research area.

If you take the EU as a whole compared to the US, we have more joint publications with the combined EU than we do with the US, with not too much of a difference in population sizes. We should not underplay how important a partner the EU is, particularly when you look to some areas like clinical trials. The proximity is very important, but so is our shared regulatory framework. None of us for a minute mean to dismiss the importance of collaborations in other places, but we have a particular depth of collaboration with the EU. There are great institutions across the EU that support this. The flow of talent has to be in all directions for science to thrive.

Professor Arthur: Can I just make a point about collaboration? The point about the European Union research funding is the ability to work across multiple borders with great ease, with a single application system and high-quality peer review.

You can work and collaborate with other countries. Of course, collaboration goes on bilaterally all the time in academia, but as soon as you try to go trilateral, you find yourself applying to the research councils in the UK, NSF in America and whatever the relevant system might be in China. You have three different lots of reviewers; it takes forever; and it often falls down in one country or the other. That does not happen with the EU. You can work across eight or nine borders and, crucially, you can bring in outside countries to be part of that programme, again through a single review system. This is critically important.

If you think about the world's greatest problems, they are never going to be solved by one country or one institution. They are going to be solved by big collaborative efforts. The EU is the world's best system for supporting that approach to research.

Q1721 **Craig Mackinlay:** Can you see some positive new collaboration coming out of Britain's departure from the EU? Could this collaboration get better, rather than being focused on one part of the world, which frankly has universities that are not in the top league when you take the UK out of it?



HOUSE OF COMMONS

Professor Arthur: I was going to criticise the league tables, but far be it from me to do that.

Dr Thompson: One interesting impact of Brexit is that it has made our sector less complacent about the collaborations that we have and the importance of global collaboration. It is making a number of organisations think more proactively about how we partner internationally. To some extent, there is a sense in which this could help collaboration.

To build on Professor Arthur's point, there is a critical point here about budgets. We have an excellent EU funding programme—the best multilateral scheme in the world. No one else can match it. The reality is that, where our international partners, such as the USA and Canada, are looking to collaborate internationally, they will likely look to Europe because it has this centre of gravity in terms of a multilateral programme, which may limit the budget they have to collaborate bilaterally with the UK.

In terms of bilateral collaboration within the EU, many of the EU countries we collaborate most strongly with tend to invest very heavily in that EU programme as their main route to international collaboration. We have to be very pragmatic and realistic about the funding that other countries would have in order to do further collaborations.

Q1722 **Craig Mackinlay:** I have a final one, because there was a question in my statement. Is the flow of academia, in numbers, more EU to the UK, more UK to the EU, or is it matched? Does anyone have a handle on those numbers?

Dr Main: Elsevier produced a report that looked in a great deal of detail at these kinds of flows. I honestly cannot tell you all the numbers off the top of my head, but the report was done by Elsevier for the Department for Business, Energy and Industrial Strategy, so I can forward it on.

Chair: That would be extremely helpful. Thank you very much indeed.

Q1723 **Stephen Kinnock:** I want to come back on something that Professor Arthur said earlier. You mentioned this Brexit mitigation committee that you are involved in. You said it has met 40 times since the referendum, or whenever it might have been.

Professor Arthur: Since the referendum, yes.

Q1724 **Stephen Kinnock:** I was just wondering if all the panellists could give a sense of how much of your time is now being absorbed into dealing with the fallout of the 23 June 2016 referendum. If you had to give a rough number of hours in a week that you are spending on dealing with this rather than dealing with your business as usual, would you be able to give an estimate of the percentage of time?

Professor Arthur: I will start while the others think. I would describe it as being very intensive in the early phases after the referendum, largely around all the people issues. It is really difficult to explain, but there were



literally Europeans crying in my office—those were the levels of emotion. There was lots of anxiety about futures, families, access to healthcare, the sorts of things that matter in feeling stable in your environment and work. The human impact stuff consumed a lot of hours of a lot of leaders in the institution, and I think we would be running into hundreds to thousands of hours in that initial phase. About 20% of my staff are EU citizens. Of course, EU students as well were deeply upset.

Over time, it has lessened. My Brexit mitigation group, which was meeting weekly, now meets monthly, and we put in the occasional emergency meeting if something else happens that we need to think through. It is quite a high-powered group—it involves some of my vice-provosts, some of my deans, my key directors of HR, finance, and so on. We are trying to manage that level of uncertainty as best we can. The answer is that it is very significant, but I could not give you a precise number of hours. Fortunately, they do not clock my hours in that way. Actually, perhaps it would be to my advantage if they did.

Stephen Kinnock: I am not suggesting you send the Committee a timesheet or anything like that.

Dr Main: I heard a really different perspective from a digital company that engages in a lot of these framework programmes that we have talked about. It is a US-owned company with a presence in London and mainland Europe. They described a conversation after the referendum in which they met for about 10 minutes and talked about the business risk mitigation I mentioned earlier. There was a bit of saying, “Goodness, what should we do now?” There was then a business risk decision, which they made very rapidly, that they would simply have to increase their base in mainland Europe in order to have a reasonable business plan going forward that meant they would still be able to engage in all the programmes that we have heard about.

Across the different sorts of organisations I deal with, there is a full range of answers to your question, from very deep involvement to some businesses that, because of their nature, have to make quick decisions. That ties into the point that Professor Brook made earlier about some of the consequentialists that are happening now, simply because people have to make choices.

Professor Brook: This is a very subjective assessment. Personally, I would say it is about a third of my time. For our individual members, there will have been some quite serious discussions at board level and senior management level about strategy. I can go and ask what the impact has roughly been, but I do not have a figure. HR departments have been very heavily involved in the process of reassuring staff, and that has taken very considerable time and a lot of staff meetings.

I know one member that has taken the decision to establish itself outside the UK. They said to me that a million pounds of investment that they were proposing to put into a facility up in the north-east has now gone to



Ireland. That kind of decision has been taken at board level. I think the decision was fairly quick, because they have no alternative unless they are going to take a major risk with losing future business. For want of a better number, I would guess maybe a third of board time would be concerned with Brexit issues, sometimes more, sometimes less. It is a significant amount.

Dr Thompson: I can be very brief. Wellcome does not receive any funding from the EU—our funding is independent of the EU, so our role on Brexit is rather different. We are focused on making sure that we can get the best possible deal for science. That said, my team is focused on making sure that we have a great environment to do research in, and Brexit poses significant challenges to that, which we have to mitigate. We are spending a significant amount of time on that as a team, but those are not mitigation activities in terms of Wellcome's own business.

Q1725 **Stephen Kinnock:** I want to get on to the design of framework programme 9. Professor Arthur, you mentioned that you have been out in Brussels working on the design of framework programme 9 and involved in inputting to it, as the UK has always been since its membership of the EU started and since these programmes started. Have you noticed any change in the dynamics of the relationship and the extent to which the UK has been able to influence the shaping of the programme?

Professor Arthur: To be clear, we have not been directly involved in discussion of the design. We have submitted evidence and our view, as the Russell Group, and that has been quite well received. It has also been quite well received and shaped the British Government's view as they enter the negotiations.

How can I best describe the reception one gets? Most meetings start with a level of incredulity at what we are doing, and some requests for us to try to explain what is going on and where we have got to, which is always difficult because we do not know the detail.

Stephen Kinnock: Join the club.

Professor Arthur: I would definitely say that there is very, very strong support for continued British involvement in European science, from all of the officials, the research director, and the Commission. Commissioner Moedas in particular is clear about his desire to continue to see strong UK involvement in all the instruments of framework 9, and beyond framework 9 as well. He has been pushing for his catchphrase, which is "open innovation, open science, open to the world". He wants to see many other countries involved with European research and innovation, and begins to describe our future as being one of the leaders in that bracket of other countries that will be involved in the EU.

The Russell Group hopes that we can move through to an overarching agreement. Presumably there will first of all be the framework agreement in October, and then the more detailed work in the transition period. The



science elements of this are fairly straightforward, with a couple of issues, not least of which is the mobility issue we have already discussed, which it intersects with our ability to be effective in European research. We find really strong support and we find that, by the way, from all the major European agencies, research agencies, Max Planck, CNRS, and from our collaborating universities, from the rectors. They have all been making representations to their Governments that European science is significantly diminished if we are not involved. It is definitely a win-win. Europe gains a huge amount by our continued involvement and we gain a huge amount by our participation.

To our mind, by the way, that is not just about FP9 in its narrow sense. It is about all the instruments; it is about innovation, Marie Skłodowska-Curie, and Erasmus and student exchange. We think we need a package that provides that continued arrangement as an associated country, but where that association agreement is tailored to the nature of what you can bring and recognises the value that we bring. That is what Commissioner Moedas means when he says “open to the world”. He wants to see different arrangements for different countries, to bring them to that level of excellence.

Dr Thompson: This concept of an association agreement and being an associated country within FP9 is really important, particularly because we are in the middle of drafting legislation at the moment. In this, we are not looking for a complete departure from the way the EU works. There have always been associated countries within those EU programmes, such as Switzerland, Norway and Israel. Therefore, we need to make sure that the FP9 legislation creates a route for the UK to participate in that.

Under the current Horizon 2020 legislation, it is not clear how the UK would engage, so it is really important that we take this good will—we hear exactly the same as Professor Arthur from funding organisations and the research community across Europe—and turn it into a clear political path that will take us towards an association agreement. We cannot have that association agreement until the framework programme legislation is finalised, so that is some way away, but it would be very helpful as soon as possible to have clarity on what that deal might look like and where we are heading, not least to make sure that the framework programme legislation creates a clear route for the UK to participate. We think everyone agrees with that principle.¹

Q1726 **Stephen Kinnock:** It is very useful to hear from the panel your clear view that, within that overall political path, the association agreement path sounds like the only one that you could see working, in terms of that overarching agreement and more specifically for your context. My final

¹ The witness later clarified that she was referring specifically to an international agreement on association to the Framework Programme, rather than an Association Agreement. The principles of this agreement on association are currently set out in Article 7(2) of the Horizon 2020 Regulation 1291/2013.



HOUSE OF COMMONS

question is this. You have said one of the upsides of Brexit is that it has forced you to think more globally and not default to the relationship with the EU. Can you see any scenario whereby that advantage could potentially outweigh the disadvantages of disrupting the relationship with the EU that Brexit has caused?

Chair: A very brief answer from any one of you would be fine.

Professor Arthur: No.

Stephen Kinnock: Thank you very much. That is fine.

Q1727 **Richard Graham:** All four of you have of course seen the PM's Mansion House speech, where she called for a far-reaching science and innovation pact, and we want to take a similar approach to education and cultural programmes. You all know the detailed paper, the "Collaboration on Science and Innovation—A Future Partnership" paper. You also all know the EU's comment, which is that the future involvement of the UK will be subject to agreement on the framework. From your point of view, have the Government not basically set out a clear view and strategy that is supportive of what all of you and all of us want to see? Therefore, is the ball not very firmly in the EU's court?

Professor Arthur, what have you done to encourage them to respond to the strategy of the Government, in terms of that pillar of thematic co-operation that Michel Barnier so often uses?

Professor Arthur: You are absolutely right that those speeches and papers say exactly what we would like them to say. Those speeches were very important in settling things down and making us feel confident that our Government want to push in the right direction. When we are in Brussels, we find that there is similar agreement. Obviously we are not talking directly to the negotiators, so we are talking to the machinery informing the negotiators.

Q1728 **Richard Graham:** To be specific, my query really was this. What have you done to encourage the EU to respond to the Prime Minister's strategy, in terms of its pillar that is designed for the thematic co-operation, by including precisely what our Government have laid out?

Professor Arthur: We very actively supported the UK Government's position, and have encouraged all of those to whom we have been talking to come to the party. We find that they are keen so to do, but that the issues relate not to the specific question, but to other aspects of the framework agreement and other difficulties. We always hear, "But of course much will depend on what happens over freedom of movement; much will depend on what happens over the Northern Irish border, as to whether there will be an agreement as opposed to a hard Brexit". On the specifics of the science interaction and agreement, there is close proximity of views in Europe and with our Government.

Q1729 **Richard Graham:** In terms of what you were saying earlier about the potential financial impact of the changes in student fees, I think I am



right in saying that EU tuition fee income for higher education institutions is currently 2.3% of total income. That is a gross figure, so it is not net of the costs of student loans or maintenance loans, for example. Are you really suggesting that higher education institutions would not be able to compensate for the 2.3% loss of total income, in the very worst, most unlikely situation, by increasing the number of students from elsewhere in the world?

Professor Arthur: The 2.3% is not a number that I know. I am quickly trying to do the mental arithmetic for UCL, which I will do in between questions.

Q1730 **Richard Graham:** UCL may be slightly different, so I do not want to particularly ask you about UCL. I am thinking of your wider hat. Anyway, while you are mulling that over, let me turn to Professor Brook. Professor, in relation to what the Government have laid out for our hopes for future co-operation with the European Union, you have seen with your expertise on space programmes these, to my mind, extraordinary announcements from the EU, which would, if taken literally and not altered, effectively mean that businesses like CGI could no longer work on Galileo programmes.

Professor Brook: From the UK, yes.

Q1731 **Richard Graham:** Indeed. I have heard from businesses that it could lead to a delay of up to three or five years on the European Galileo programme if that happened. It would be a moot point as to whether, if the UK pursued its own independent strategy, we would be able to produce something that was arguably better than and possibly just as fast as the European Galileo programme. My question is why, if the EU organisations are making all the positive noises that all four of you have indicated, and our strategy is to work with them very closely, they would be doing this. Is this just a cock-up, or is this actually a negotiating tactic to try to arrive at more contracts for French companies, for example?

Professor Brook: It could be a combination of those things. Industry outside the UK has an interest in securing work that is currently coming to the UK. Certainly, it will put pressure on the UK to compromise.

Q1732 **Richard Graham:** To respond individually and create its competitive programme? Is that a success for the EU?

Professor Brook: They think we are bluffing. To some extent, those in the Commission who are charged with mitigating the impact of Brexit are looking at where there is reliance on the UK and, because nothing is agreed until everything is agreed, they are assuming the worst and taking action to protect, as they see it, the EU's interests. They see that they need to act now to reduce reliance on the UK. Where they can find reasons to do that—in this case, it is security—they are implementing their own mitigation strategy.

Q1733 **Richard Graham:** In a nutshell, once the top level talks arrive in the



HOUSE OF COMMONS

right sort of place, do you see these issues disappearing or intensifying?

Professor Brook: In this particular instance, it is a question of what our relationship on security and defence will be with the EU.

Q1734 **Richard Graham:** All right, let us park that there. We know Michel Barnier's view that it should be very close. Dr Thompson, from your point of view, the Wellcome Trust is not implicitly involved in EU research funding or anything like that. Standing back from all this, of course any uncertainty is unwelcome to any organisation, and risks that are known about are set in all sorts of processes, with risk management criteria and the rest of it. From your point of view, the biggest risks that organisations see over the years are always the ones that are unexpected and unknown about.

To some extent, is the rather Eeyore-ish response that we initially heard today from all of you, and indeed many witnesses, not an absolutely natural reaction to the challenges of the unknown? But when you actually drill down into the detail, as Professor Arthur was saying a little bit earlier, the overall desire on both sides for co-operation on these issues is so strong that it is really hard to imagine the worst-case scenarios and the tumble from second to 20th place in research quality that was mooted earlier actually happening.

Dr Thompson: There are real risks and real challenges that we have to address. There are reasons to look forward positively in terms of how we can manage and mitigate those. Because there is a win-win on both sides if we can get associated country status to the framework programmes, to maintain the depth of that collaboration, if we can resolve the issue of harmonising key pieces of legislation and, critically, sort out this issue about mobility of researchers to make sure that they, their teams and their families can move and feel welcome in the UK, there are positive solutions. Both sides have the will to do that.

A concern we have is that, because nothing is agreed until everything is agreed and difficult and challenging issues are going to come up in other sectors along the way, research could be sacrificed on either side. That is critical to avoid for all our sakes. That is one of the reasons that we would like to see commitment as early as possible on the path that we and the EU are taking towards this association deal, and coming to a sensible arrangement on people and the mobility of researchers. For us, that is absolutely critical, and we hope that doing something positive there could create a positive tone and a helpful dialogue for the rest of the negotiations.

Q1735 **Richard Graham:** This final question is really for Professor Arthur, but I am interested in comments from any of you. Professor, you said earlier that, with our change of status in the European Union, it would become discriminatory to charge one lot of overseas students one fee and others another. You intimated that raising the fees for EU students to those from the rest of the world would possibly disadvantage those from social backgrounds who had less money to afford it.



Standing back from your close involvement with the EU at UCL, is it not rather curious in a sense that we expect students from the rest of the world, including from Commonwealth and African countries that are of course not as well off as the European Union, to pay a higher fee than European Union students? For example, if you were a very bright Indian student wanting to study engineering or medicine in the UK, would you not find it rather curious at the moment that you have to pay so much more than somebody from the European Union? In terms of the longer-term research strengths in the world, do you not see the advantages of having more students from Asia in particular, where so much innovation is happening?

Professor Arthur: Let me answer with a position statement. In everything that I have said and most of the panel have said, we are really interested in making sure that our higher education sector and our research sector remains internationally competitive at the highest level after we leave the European Union. We think that is terribly important to the future of this country, its position in the world and its economy. That is what motivates us. It is really important to understand that we are not trying to reverse Brexit or be "Remoaners". We are literally trying to find the best way forward for ourselves as a nation.

Q1736 **Richard Graham:** I certainly met plenty of them at UCL not long ago, but we will pass on that.

Professor Arthur: To come back to your specific question, it is difficult and we struggle a lot with this issue about the money that we charge and the social demographic that we pull in from around the world. We are desperately trying to put in place a philanthropically funded scholarship scheme, the type of thing that you would regularly see in the United States of America, to bring the very best from those countries on a needs-blind basis. We are not at that point at the moment.

I often get asked to justify the fees to international students. The difference of course is that they are coming into an environment that the British and EU taxpayer has helped to create and they need to contribute to that environment. Coming back to your 2.3% question, my surplus last year was 4.6%. At threat is half of my surplus—that surplus is used to reinvest in the future of UCL and science. It is a significant factor.

Q1737 **Richard Graham:** Of course, as you were suggesting earlier, if you raise the fees to EU students, the likelihood is that your fee income will increase rather than decrease, unless all those EU students prefer to study elsewhere.

Professor Arthur: The best modelling that we have had has shown us at breakeven. You are talking about UCL, a major global player in the top 10 in the world, except for *The Times* higher education table. We are extremely attractive, and we are probably going to be fine through this, but if you take it across the rest of the sector you are going to find some



HOUSE OF COMMONS

universities that struggle with the loss of income, if EU student numbers go down.

Q1738 Richard Graham: Very lastly, for a once sentence answer, Professor, when you said earlier that you thought there was a risk of the UK dropping from second to 20th in the world ratings, would you like to take the opportunity to say that there was a bit of hyperbole in that, and that the future rating of British higher education ultimately depends as much on the quality of that education being available as on anything else, whether Brexit, immigration or other?

Professor Arthur: The honest answer is that none of us know what the impact would be of a significant exit from European research and funding. We are worried about it, and we need to express it in ways that get people to understand the magnitude of change that could occur.

Q1739 Hywel Williams: Good morning. I would like to ask you some specific questions, and I appreciate you might not have the particular knowledge, so if that is the case can we move on sharply to the next one. I am sure the Chair would be glad if we could do that.

First, I have a constituent who has retired from CERN. Do you know what our likely status within CERN will be after Brexit? I know that CERN is not an EU project, but I understand it has associate membership, which is currently going to be extended to Lithuania, Serbia, Cyprus and other countries. Is that the fate that awaits us as far as CERN is concerned?

Professor Arthur: My understanding is that we will continue to be involved in CERN because it is not an EU set-up and we subscribe to that through other mechanisms.

Q1740 Hywel Williams: So there is no change?

Professor Arthur: Yes.

Q1741 Hywel Williams: Secondly, the European Social Fund provides about £7 million of funding to the higher education sector and higher education institutions. Most of that goes to Welsh universities, because our economy still rumbles along at the same level as eastern European former communist states. That is why we get it. Do you have any comments about the peril to that funding and how it might be replaced after Brexit?

Dr Main: Last year, the Welsh Government commissioned a review of Government-funded research and innovation in Wales, which I was involved with. It was led by Professor Graeme Reid. It is clear that the structural funds from the EU will no longer be coming to the UK after we leave. That is the basis on which all predictions are being made. That review tried to assess the changing income streams into Wales, particularly a decrease in structural funds, changes to the quality-related research funding that goes to universities in Wales, and the availability of funds through UK Research and Innovation. It tried to make suggestions about how Wales could capitalise on the opportunities available from the



HOUSE OF COMMONS

increased UK-wide investment from the Treasury in research and innovation, via UK Research and Innovation.

Q1742 Hywel Williams: On this thought, I have been told that there is something called the Shared Prosperity Fund, which will be set up with repatriated EU moneys. Have any of you heard anything about any planning, consultation or application procedures for that money, or would I perhaps be better off researching unicorns?

Dr Main: The Shared Prosperity Fund has been discussed in some meetings that I have attended around research and innovation, because there is an element of structural funding from the European Union that has supported research and innovation. We would hope that some of the Shared Prosperity Fund might also support UK research infrastructure. I too have not heard much more about it since the original announcement.

Professor Brook: The £115 million Strength in Places Fund has been announced. There are progressive announcements of parcels of money aimed at things like the place agenda, but we do not have a complete picture of how all this money will be rolled out. It is coming out piece by piece.

Q1743 Hywel Williams: You will appreciate my concern that the ESF money, for example, is provided on a different set of criteria from those that might apply to a Shared Prosperity Fund, and we might not be able to compete so effectively.

If I can ask one last, slightly cheeky general question, I recently attended a colloquium of ocean scientists in Bangor. They are researching the ecology of the Irish Sea. This is between Swansea, Aberystwyth, Bangor, Cork and Dublin universities. At the end, one of the scientists came up and said to me, "The trouble, you see, is that the fish do not know where the international border is". Then he said, "Bloody stupid fish". I do not think he actually meant fish, but there we are. Are you confident that Brexit Ministers are fully informed and aware of the international nature of much scientific research? If not, what can we do about it?

Chair: That has stumped everyone.

Professor Brook: There are all sorts of consequences that you can start thinking about in relation to taking decisions. I do not know whether people have thought through what the consequences and the knock-ons are. It is clearly a very complicated situation with a lot of interdependencies.

Dr Main: I will say a word for one of the DExEU Ministers, Robin Walker, because I was in a meeting with him where some of these particularly difficult issues around conservation, ecology and the borders and lines of the ocean were being discussed by a range of organisations that had an interest in them. I know that Robin Walker was present in those conversations at a very early stage, so at least some Ministers in the



HOUSE OF COMMONS

Department for Exiting the EU that I know of have been made aware of the nature of that.

Q1744 Seema Malhotra: I first want to pick up on the questions that have been raised about the potential opportunity of having students from outside the EU and what the range may be. I have been puzzled by some other conversations about this recently. In particular, the Indian high commissioner had this as a major issue to raise with Theresa May at CHOGM in relation to the huge drop in Indian students coming to the UK, which now falls behind those going to Germany. There has been a massive increase in those now going to Australia and the USA. They see it as potentially a friendlier climate as well. What is your experience of a drop in other countries where we have had stronger relationships before? Has that been relevant in the sectors in which you are working?

Professor Arthur: I can give you my experience from when I was vice-chancellor at the University of Leeds. We had a 75% drop in students from India in one year, which continued and was related to us removing the right to work for two years after study. Most Indian students fund themselves with bank loans that they repay by staying on in the UK and working for two years before returning home. In contrast, that would not be the culture in China, where people usually pay up front, supported by their families. The one child policy has led to a position where grandparents and parents will often support study. There are very different things in different countries.

We have never recovered from that, and, in contrast, other countries have added work years after study. In the case of Canada, it goes as far as guaranteeing that, if that goes well, you get citizenship rights. Essentially, the market changed dramatically. UCL was very different; there were very few Indian students in the first place, and it has continued at a low level ever since. It is a major opportunity for us, but it would need a change of regime for post-study work.

Q1745 Seema Malhotra: That is extremely helpful. If I could come back to the questions that we discussed around regulations, I am particularly interested in exploring an area we have not discussed as much, which is around clinical trials. You have laid out the case very clearly in previous evidence you have given around the need for stability and harmonisation of regulations, and the impact on co-operation and needing an increased population in which you can do trials, 66 million perhaps not being enough. If I can briefly play devil's advocate, I am interested to get your perspective on whether in reality you think that we will fall out of international trials if we do not achieve everything that you might hope for in the negotiations. How big a risk is it?

Dr Thompson: "Fall out" is an interesting way of looking at it. It may well be possible. If we adopt the new EU clinical trial rules, the clinical trial regulation, as the Government have committed to, our rules will be aligned, but we will not have the same strength of system that we have to co-operate with the EU as the other member states. They are creating



HOUSE OF COMMONS

this new clinical trial framework where data will be shared much better between the different regulators, and where you will be able to put in one application to run a trial across multiple member states.

If we align our legislation but cannot play in that system, it will still be possible for a researcher to conduct a trial that has sites in the UK and sites in the EU. It will remain possible in that scenario, but the challenge is that it becomes more difficult. There would be added bureaucracy if you had to submit separate forms to the UK regulator. There would be more admin to manage across the two sites. We are not talking about trivial amounts of admin—it takes the research team months to pull together these clinical trial dossiers that they submit to the regulators, so it is not a form that you knock out in an afternoon. The levels of bureaucracy would be really significant, and there is a chance that that would put off EU collaborators, because they do not need the 66 million population in the UK to make the trial work for them.

There is a really important point here about leadership, which mirrors other areas that we have seen. If we cannot take part in that whole system because we have aligned our law but we do not have the same depth of collaboration, it may become impossible for UK sites to lead clinical trials. We know that the UK is a fantastic destination for clinical trials at the moment—we have real academic strength and we have real strength in our hospitals. That is a benefit to the EU as well if we can all collaborate, but there is a risk that we would lose some of our leadership position.

Q1746 Seema Malhotra: Is there also a risk that the quality of those products could be affected, in that we have in some ways a different and more diverse population? Every country is different in its demographic make-up. Other areas of research would suggest that, for ethnic minorities, you need to have a much wider pool in which you are doing the research to get products that may be more workable. Is that also a risk?

Dr Thompson: Not to product safety itself, because the regulators will always look at the breadth of the data. There is an issue with inclusivity in clinical trials. That is something that the UK population really does bring, if you look at the UK and EU 27 population. It is a slightly separate issue. The regulators will not let unsafe data from the trial lead to poor use of a product, but it potentially has an impact on which patients are being included in trials, which is a problem for individuals but also potentially for whole populations who are less well represented in mainland Europe.

Q1747 Seema Malhotra: I want to ask a supplementary question around what it could mean for people in Britain about access to new treatments. The Health Select Committee has done some work around this, and it would appear that, if you are not in the EU, there could be quite a significant delay, potentially six to 12 months, before you have access to new treatments and medicines. Would that also be a concern to you?



HOUSE OF COMMONS

Dr Thompson: It is a concern. There are two elements to this. The first is that, if the UK is outside the European Medicines Agency framework for licensing drugs, this small population is less attractive for big pharma to sell their drugs into. We are not such an attractive market and they are likely to go to the bigger markets of the EU and the US first. We certainly see in countries that are not part of those bigger markets that drugs arrive later.

There is also a relationship between where drugs are tested and trialled and where pharma will look to launch. If we are less attractive as a destination for clinical trials and have less leadership in that area, it will partly affect the way that the pharma industry sees us as a market.

Q1748 **Sammy Wilson:** Professor Arthur, maybe you could come back quickly for a moment to the claim you made, which you have now said is unsubstantiated. None of us knows what is going to happen in the future—you said that from having some of the top-class universities in the world, we could drop down to 20th. You have indicated that none of us knows what is going to happen, so on what basis do you make such a claim, or is it simply part of the project fear that we have expected over this whole debate?

Professor Arthur: I spend a lot of my time thinking about, interacting and operating among those best universities in the world, and it is highly competitive. There is really quite a dramatic and rapid rise, particularly of the leading Asian universities. For example, if you look at top 10% citations in mathematics, you will find the top two universities in the world are Chinese: Tsinghua and Peking University are ahead of the Americans. They are rising very quickly as well in physics, chemistry and the physical sciences, so there is no doubt in my mind that it is extremely competitive at the top level. Nanyang Technological University in Singapore would be an example—it has risen 60 places very quickly in those global league tables. It is against the background of knowing really quite well how competitive it is at the top.

One of the points about European universities only being 60th is that there probably are about 12,500 universities in the world, so if you are in the top 200 you are doing incredibly well. It is against the background of knowing how easy it would be to slip back if we could not compete at the current level. I will confess I plucked a number—20th—out of the air. I do not know, but I fear we could slip down those international league tables.

Q1749 **Sammy Wilson:** I am interested in the answers that you have given, because in all the evidence that we have had this morning there has been a smattering of the potential that there may well be for collaboration with universities and higher education establishments outside the EU. All the concentration has been on the EU, and yet now you are telling us that some of the fastest rising universities, and the ones that are doing the research and work into the leading technologies and the things of the future, are found not in the EU but outside the EU. Do the opportunities that leaving the EU presents for universities not become even more



important, given where the new focus of growth in research is to be found?

Professor Arthur: I explained that in an earlier answer. For us, it is the rest of the world and Europe, in order to remain that competitive internationally. For example, UCL has a formal deep partnership agreement with Peking University. We have one with Yale. We are working on one with Toronto. We are working on one with the National University of Singapore. We are working on one with Osaka University. We would be doing that anyway.

We are saying that the total ecosystem includes our access to free exchange of great pools of talent into our university with Europe. Can we take all of that and replace it over here? There are no special arrangements, agreements or funding. It will not work as well as the EU system if we are looking at the rest of the world only. We would like to have an arrangement where we can continue to work with both.

Q1750 **Sammy Wilson:** That brings me on to the next question. There are two ways in which we can continue the co-operation and collaboration that there is at present: to find a way of contributing to EU programmes, or else to drop out of EU programmes, if the cost is too prohibitive, and to use that funding to set up our own arrangements. Can we maybe take the second of those first? If we go down that route, many people would point to the restrictions, for example, of Horizon 2020. It is bureaucratic—it has improved now, but it took over a year to process applications. Many people believed it was more social than scientific, because the collaboration had to be between three organisations and three countries, even though that might not have produced the best research results. It did not give scientists the freedom to look for collaborative ventures.

Is there not some advantage in saying that, if the huge amount of money we put into European science projects at present was freed, we could direct it towards programmes that were more designed to give us good scientific research, which could perhaps open the door to small and medium-sized enterprises, which tended to do very badly in Horizon 2020? It would also give us the opportunity to divert some of these resources towards those parts of the world and those universities that you have said and admitted are now at the leading edge.

Professor Arthur: We would lose two things that would be difficult to replace. One is that ability to work across multiple borders, which will become increasingly important in the world, to tackle the big, global problems. If there was a global arrangement and a global fund, that could be solved, and we could presumably contribute to that. I would suggest that we are a million miles away from the position where we can collaborate that freely internationally and put funding at the centre of it.

The ability to work across multiple borders would be lost if we went to a domesticated system, unless we paid for research to be conducted in



HOUSE OF COMMONS

other countries, or at least paid large sums of money for research in other countries, which I would suggest is not likely in any foreseeable future. That is the first thing that we would lose.

The second thing that we would lose is access to the European Research Council and its fellowship programme, which has become the preeminent international system. We could set something up that is similar, and we are thinking about that. I know that the science community is thinking through what that would look like, but it would take a long time to catch up with the success of the ERC and the flow of people that the European Research Council has generated, which has been of huge benefit to British universities. Of course, it would be in direct competition with the European Research Council, so it would not necessarily be as good, at least initially.

Q1751 Sammy Wilson: We have seen it in Northern Ireland, where a lot of small and medium-sized enterprises wanted to engage in collaboration and research, but found it became bureaucratic because of the very onerous obligations on them to find two other partners across three countries. Sometimes it became almost impossible. They did not even have the knowledge as to where to look. To have that funding available for a bespoke arrangement for the United Kingdom could overcome some of the difficulties and open doors for research in the smallest and most innovative countries, many of which are excluded at present.

You mentioned the European Research Council—it has been described by some people as “Robin Hood in reverse”, because it tends to favour those people who are already well established and who have published in the big science publications. The grants, of course, are large. Many of the innovative research programmes come from people who are just starting off and who perhaps need smaller amounts of money.

This is all I am asking. Is there not an opportunity, if we decide not to contribute to EU projects after leaving the EU, for us to design a better funding project that would allow collaboration and overcome some of the difficulties of what is basically a politically driven research programme at present?

Dr Main: I have worked with both universities in Northern Ireland recently on issues similar to this. One of the answers to your question is that the UK Treasury has invested hugely in research over the last two years. The budget that is now available for UK research and innovation has increased hugely; over the next few years, it will increase from £6 billion a year to approximately £8 billion a year. One very important element of that is the innovation element, run formerly by Innovate UK and now as part of UKRI. You will know that the Industrial Strategy Challenge Fund is there, alongside other programmes.

The particular conversation I was having with the universities in Northern Ireland was similar to the situation in Wales: how the Northern Ireland universities could maximise their participation and receipts from this



HOUSE OF COMMONS

UK-wide competitive fund. I would suggest it does not have to be an either/or. I understand that perhaps some of the SMEs you have talked to have found the burden bureaucratic with the EU, but I have spoken with many other SMEs that have found it a positive thing. I am sure there are a range of views. The innovation arm of the European funding has been broadly well received by SMEs across the UK. There are, in parallel, really strong UK funds now available for all sorts of support for innovative research and development, including with international collaborations. Both are available.

Q1752 Sammy Wilson: The most likely outcome, anyhow, is that we will find some way of staying within the European science project and make some contribution towards it. I am not so sure it is the best way but, if that is the way we decide to go, how do we maximise the return that the United Kingdom gets from it? Currently, if you look at the European Research Council grants, two countries from outside the EU—Switzerland and Israel—get the highest return per head of population from those grants, and it is the same for some of the other projects. What particularly do those countries do? How have they shaped their participation to ensure they get those kinds of returns? Is that something the Government have to do in the negotiations, or is it something the universities and researchers have been able to do by being successful in making the applications?

Dr Thompson: I cannot comment specifically on what is happening in Israel and Switzerland, but the UK does very well in terms of ERC grants but also other types of Horizon 2020 funding at the moment. We will be, because of the strength of our universities, in an excellent position to compete if we maintain our membership of those schemes in the longer term. We are in a great position to compete.

You mention what it will cost. That is a key issue on both sides of the channel in terms of what the UK's contribution will be and what the EU would consider fair. Our view is that, although at the moment the UK is a net beneficiary and does incredibly well out of these schemes, we need to think about more than just the numbers. As Professor Arthur said, in terms of the ease of multilateral collaborations and the benefits of the European Research Council funding for individuals, it is incredibly difficult to replace. I appreciate your point that the schemes are not perfect and there is bureaucracy, but we have to think about more than just what we get back in terms of the numbers, because there are huge collaborative benefits, access to the infrastructure, which we have not spoken much about today, and the ability to shape European infrastructure and, indeed, host it. There are key benefits that are not just about the money.

Chair: We are going to have to move on, because we are running out of time.

Q1753 Peter Grant: Can I go back to the questions that you raised earlier about the visa system, which is based on salary level? Within some of the healthcare professions, that creates significant geographical



HOUSE OF COMMONS

discrimination, because the geographical variances in salary mean employers in some places get the visas and employers elsewhere do not. Does the same thing happen, or is it likely to happen, within the world of academia, higher education and research? Is the immigration system effectively going to discriminate against employers and universities in parts of the UK where, for a number of reasons, salary levels are a bit lower than they may be in London, for example?

Dr Main: We have the breakdown of these types of jobs. There is a story behind each type of job. I gave you top-line numbers for the people involved in engineering type roles or tech roles—that could be a software engineer, for example. It could be someone based in Cambridge at a research centre. It could be supporting a small business in Leeds or Scotland. There will be differences in expected remuneration for the same types of roles across the whole of the UK so, yes, the point you make is likely to be true. We do not have details on the proposed salaries that match each of the applications, but I do not know if the Home Office holds that data.

Q1754 **Peter Grant:** I want to move on, because I have very little time. You have all mentioned the move from significant uncertainty on the day after the referendum to not complete certainty but a degree of certainty. On a scale of zero to 100, where zero is the day after the referendum and we have no idea what is going to happen, and 100 is, “Well, we do not have absolute certainty and we maybe do not like some of the answers but we have the answers that we need to get on with planning for how we are going to deal with that”, where would you say we are just now, as far as your particular areas of expertise are concerned?

Professor Arthur: After some recent questions I am reluctant to pluck a number out of the air, but say 30 or 40.

Professor Brook: I was going to say 30.

Q1755 **Peter Grant:** When do we need to get to 70 or 80? Suppose we pluck a date of March 2020 out of the air and we say at that point, “Any transition is over and the implementation is effectively over. We are now in this for real.” How far ahead of that do you need sufficient certainty to plan for it, whether it is recruitment, establishment or disestablishment of classes, people and processes? What is the lead-in time that you would be looking at, supposing it goes live in March 2020?

Professor Arthur: It is now. It is very immediate. In particular, the academic cycle of students runs on an annual basis. We do not yet have certainty about 2019-20, so we do not have a clue about 2020 onwards at the moment. As for research, to pull together a major application takes perhaps a year, particularly if you are negotiating with European partners. We would be thinking about putting applications together for a year down the road already.

Professor Brook: For new product introductions, you need to work out how you are going to get your CE marking or whatever approvals you



HOUSE OF COMMONS

require. You need to start on that at least nine months before you are planning to introduce the product, so it is now. Otherwise people will not know how they are going to put their products on the market.

Dr Thompson: We have heard today about the strength of feeling on both sides that we should come to a really good deal for research. The will is there, and turning that into some tangible progress and clarity now, to get as far as we can as quickly as possible, is crucial.

Q1756 **Peter Grant:** Dr Main, have you anything to add?

Dr Main: I would agree with what has been said. We have heard from businesses across different parts of the sector, whether they are pharmaceuticals or manufacturing type activities in aerospace or data, that they have already either put in contingencies on a business risk basis or are planning for them. I would agree with the “now and as soon as possible” message.

On the detailed issues, such as transporting packs of medicines to patients and so on, it is important that the Government are open to having these detailed discussions about how the risks and the details of these are sorted out on a case-by-case basis. Perhaps that is something the Committee can pursue with the Department, just to make sure that those people who have the detail are able to have constructive dialogue with the Government.

Peter Grant: Thank you. I assure you it was not deliberate that we had you answering both times that the bell went, but thank you for carrying on through it. In the interests of keeping to time, I will leave it at that.

Q1757 **Chair:** Thank you very much indeed. In her Mansion House speech, the Prime Minister mentioned future participation in the medicines agency, the chemicals agency and the aviation safety agency as priorities, but she also said “other agencies”. Would you like to give us the names of other agencies in your areas of work that we should also be seeking to continue to participate in? The names will do fine. If you cannot think of them now and you want to drop us a line, it would be very helpful. Are there any that come to mind?

Professor Brook: Euratom, EUMETSAT, the food safety agency and the environment agency are the four I have written down to start.

Q1758 **Chair:** That is a start. If the others want to, do come back. Finally from me, can any of you think of a single good reason why international students should be included in the net migration total?

Professor Arthur: No.

Professor Brook: No.

Chair: You do not have to give an answer.

Dr Thompson: Students are somewhat out of my remit.



HOUSE OF COMMONS

Dr Main: I am not going to give as straight an answer. There is a definition of migrants, and I cannot remember if it is an international agreement or not. Students who stay for three years or so are technically considered, by this worldwide definition, to be migrants. It is an issue that the Government need to think about, because in other countries they create an exemption to this, so it is completely possible to say a student falls outside of these understood criteria. Is there a reason? Yes, there is a technical reason, but there is also a reason and an opportunity for excluding them. Transparency on migration and breaking down migration numbers into different categories of people so that we can all understand what exactly we are talking about is extremely important.

Chair: On behalf of the Committee, can I thank you all for your really helpful answers? It has been a terrific session and we are very, very grateful to you.