HOUSE OF LORDS

Select Committee on Science and Technology

Corrected oral evidence: Life Sciences and the Industrial Strategy

Tuesday 28 November 2017

10.10 am

Watch the meeting

Members present: Lord Patel (The Chairman); Lord Borwick; Lord Fox; Lord Griffiths of Fforestfach; Lord Hunt of Chesterton; Lord Kakkar; Lord Mair; Lord Maxton; Baroness Morgan of Huyton; Baroness Neville-Jones; Lord Oxburgh; Lord Renfrew of Kaimsthorn; Baroness Young of Old Scone.

Evidence Session No. 20 Heard in Public Questions 168 - 179

Witnesses

Dr Michael Hopkins, Senior Lecturer, Science Policy Research Unit, Sussex University; Professor Andy Westwood, Member, Industrial Strategy Commission, and Professor of Government Practice and Vice Dean of Humanities, University of Manchester.

USE OF THE TRANSCRIPT

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

Examination of witnesses

Dr Michael Hopkins and Professor Andy Westwood.

Q168 **The Chairman:** If you do not mind, please introduce yourselves for the record, and then we will proceed to the questions.

Professor Westwood: I am Professor Andy Westwood. I am from the University of Manchester, where I am a professor of government practice.

The Chairman: Thank you very much. Can you tell us something about your commission? Who set it up? What is it? What is its purpose?

Professor Westwood: I should have said that in the introduction. In the wake of the establishment of the Department for Business, Energy and Industrial Strategy, some academics at the University of Manchester and the University of Sheffield decided that it would be useful for us to think in more or less the same time cycle as government about what a new or refreshed industrial strategy could achieve. We rather grandly called ourselves a commission and invited Dame Kate Barker, formerly of the Monetary Policy Committee and many other things, to work with us and to chair the commission.

We spent roughly a year working in a similar format to this, taking evidence from a number of people who knew far more about it than we did. We produced an interim report just before the summer, not long after the Government's Green Paper. We put out our final report about three weeks ago at a launch where Greg Clark, the Secretary of State, very kindly came and made a speech to welcome it. It was just in time for their last-minute deliberations for the White Paper.

The Chairman: Thank you very much. Good morning, Dr Hopkins. Thanks to both of you for coming to give evidence today.

Dr Hopkins: I am Michael Hopkins. I am a social scientist researching processes of medical innovation, particularly those leading to diagnostic tests and novel pharmaceuticals. I am also interested in the ecosystems that support those types of innovations in the UK and elsewhere.

The Chairman: Thank you very much. I know you have several publications related to this, including a book. I have to say I skim-read it. I will have to read it in detail. But thank you for sending the policy brief. Would you like to talk very briefly about your policy brief?

Dr Hopkins: Certainly, yes. The policy brief is primarily based on the book that I co-authored with Geoffrey Owen. That explores the subject of the development of an emerging sector of UK firms seeking to develop therapeutics after the emergence of biotechnology. We focused on why it had been so difficult for UK companies, and indeed companies in other countries around the world, to emulate the commercial successes of US biotech firms. The brief sets out some of the reasons why the US has a unique set of circumstances that has led it to produce companies that have been successful more often than other countries.

When you consider the size of the US sector of these drug developing biotech companies compared to the UK sector, the briefing shows that the US firms are generally larger. We look to explain why the US ecosystem is unique. It is not so much that we are describing a case of UK failure, because so many countries have had difficulty in emulating US success. We describe some of the reasons for that being the case, and we discuss some past UK policy interventions, and we note some of the limitations that other countries face in trying to replicate the US experience.

The Chairman: You have both seen Sir John Bell's report on industrial strategy. Briefly, is the UK now addressing those constraints?

Dr Hopkins: The strategy has certainly come at an important time. It has been a response to some quite adverse circumstances in the sector. Of course, the industrial strategy in life sciences follows from previous government interventions, such as the development of an Office for Life Sciences and the life sciences strategy from several years ago. Taken together, those initiatives have helped to stem some of the losses of jobs in the sector. But there were some quite difficult circumstances, with something like a fifth of the industry's R&D spending in the UK being lost over recent years, since 2011.[1] These different initiatives have perhaps helped to slow that, but we really are talking about turning a difficult situation around. The strategy has to be seen in that context.

The Chairman: Do you have a brief comment about that, Professor Westwood?

Professor Westwood: Yes. In the Industrial Strategy Commission work, as you know, we took a rather broader view of what the sector might be. After much thought, we opted to think about it in terms of the wider health and social care sector, for lots of different reasons. We tended to think about life sciences as a supplier to that and a subsector of that broader sector, market and public policy objective. Within that context, Sir John Bell's work on the industrial strategy certainly improves the way that part of the world will work. There are still lots of questions about how government operates the industrial strategy and whether the NHS and wider challenges in health and social care help or hinder what we are trying to achieve with life sciences. But that is stating the obvious.

Q169 **Baroness Young of Old Scone:** That really leads on quite well to what I would like to raise with you, and that is the whole implementation issue. The history of industrial strategy is littered with failure to implement, and in the commission work you certainly proposed an office for strategic economic management, an independent monitoring and commentary body. The Government announced yesterday the industrial strategy council, but we do not yet know the detail of it. How should we see the life sciences strategy being implemented? What specific measures should be put in place to make it happen this time?

[1] This data comes from the 2017 OLS annual report on the sector.

Professor Westwood: Taking a slight step back to the first part of your question, you are absolutely right, of course: our track record in industrial strategy is not particularly good. Running up to the crisis, we had a long period where we virtually did not use the words at all, even though many argue that we still had an approach to supporting particular parts of the economy in a rather less direct way. You are absolutely right to mention that. It has implications for how government works and the extent to which government can come together to support an active industrial strategy of this kind. I am sure officials and Ministers at the department would admit that, yes, it is still a work in progress.

It is helpful that this strategy takes up from, leads on from and acknowledges the efforts, at the end of the last Labour Government, of Peter Mandelson and John Denham to reinvent industrial strategy. The work that Vince Cable and David Willetts did under the coalition continued to develop that and brought into government more desire to do the things that are necessary.

It is a better strategy and a better approach as a consequence of that, but what we said is that you still have to accept that history. You still have to understand that, even though the recent history is 10 years or more, Whitehall is still working its way around how to take this approach. It is still trying to understand what it means to deploy all the levers it has, from regulation and procurement to funding, to get this right.

We took the rather pragmatic view that Whitehall was best directed, particularly in this case, by an active Treasury at the heart of it. We thought creating an office for strategic economic management, in the style of the Office for Budget Responsibility, would be the best way of keeping the Treasury interested, which we think is very significant. It is much harder without that. It would also hold the whole of Whitehall to account for retaining a long-term focus on these things.

The difference between our recommendation and what we have seen so far from the White Paper is largely that the council is not on a statutory basis, whereas, like the OBR, we thought you needed to have some teeth in the system. We will see how that works out.

For specific strategies within the industrial strategy, such as life sciences, to work best, you need that overall architecture, in order to take the whole thing seriously and continue to develop the skills and capability within government to work in this way, but also to monitor and manage it properly. This is a long-term game.

Baroness Young of Old Scone: Does there need to be a specific mirror-image body for the life sciences strategy, or indeed for all the sector deals?

Professor Westwood: Yes. I should confess that I was involved in the Peter Mandelson and John Denham version, which we dared not even call industrial strategy; we called it *New Industry, New Jobs*. At that time we created the Office for Life Sciences and a number of other sector-type bodies. I am a big fan of how that can manage, co-ordinate and get

people together to do things that the higher levels of public policy do not always find easy.

Baroness Young of Old Scone: Is the Office for Life Sciences the foundation of a new body for the future?

Professor Westwood: Yes.

Dr Hopkins: I agree with Professor Westwood. Certainly, there needs to be some sort of independent agency or body to oversee the implementation of the strategy, as well as another group or agency that monitors the progress in industrial strategy, not just for the life sciences but across the different initiatives. The agency that is tasked with implementation has to be given a remit that allows it to pursue a long-term strategy. Some of the language I have seen and some of the bidding behaviour, around attempts to get funds for the current strategy, do not really reflect the fact that the goals have to be quite long term. In the case of emerging biotechnologies, such as monoclonal antibodies and gene therapies, it has taken the industry decades to progress these early-stage proto-technologies that emerge from universities through generations of R&D projects to bring fruitful products to market. Often, the first wave of products may not be that successful or may have flaws.

The Chairman: We have too many hands up, so we will have to brief with questions and answers.

Q170 **Lord Kakkar:** To come back to the point about strategy since 2011 in the life sciences, we heard that we have lost about a fifth of R&D funding over that period for the life sciences. What lessons need to be learned in terms of those previous initiatives maybe not having achieved what they could have done? Has the current life sciences strategy learned those lessons? Does it have clarity about the way it is going to implement, based on what it suggests now and what has failed in the past?

Dr Hopkins: With the current strategy, it is difficult to say how things will play out, because we do not know in full the resources that can be put behind it. Many of the initiatives suggested are needed and are sensible, but the problem is that those will be expensive and they will require resources long term. Looking at what we have seen previously in terms of specific measures in this area, in some cases there was not enough investment. In particular, the life sciences strategy draws attention to the problem of attracting manufacturing for these complicated new biologics.

This is about attracting that manufacturing expertise and building up the infrastructure for that in the UK. It takes quite a lot to draw that in and hold that capability, given that other countries are taking measures to attract those investments into their areas and regions. That would be one concern. Another thing we have to be careful about in industrial strategy generally is to ensure that sufficient social benefits are drawn from the deals that are made with industry. One has to be careful to ensure the investment is not simply a measure to keep industry invested at any cost. For example, I would like to draw the Committee’s attention to the

Cancer Drugs Fund, which has been widely criticised as providing funds for drugs that did not provide sufficient benefit to patients in the NHS.

Q171 **Lord Griffiths of Fforestfach:** I may be slightly critical in this question, but I can see the case for government being involved in something called, broadly speaking, an "industrial strategy". It funds basic science; it is responsible for education; it is responsible for infrastructure. If you take the Office for Budget Responsibility as a model, it is simply doing an independent evaluation of the likely paths of productivity growth, economic growth, inflation, unemployment and so on. It is not in any way making decisions about anything.

The more I have thought about it since last week, when Lord Heseltine came to see us, the more it seems to me that you cannot have an industrial strategy without picking winners. It comes up in the Treasury paper on patient capital, which in a way surprised me. The Treasury was saying that, at the end of the day, somebody—you talked about an active Treasury, and I can imagine it would have supporters in the Treasury—has to take a view about the risk and the long-term effects of various decisions. That is exactly what people running companies are trying to do. Ultimately, I cannot see how you can have an industrial strategy without either politicians or civil servants deciding on this company or that company. Last week, Lord Heseltine talked about doing this on a competitive basis. In my judgment, a problem still arises: what exactly are the criteria you use in an open competition for deciding on company X and not company Y?

Professor Westwood: There is so much in that question, but it is definitely the right one. In many ways, it echoes the particular history we have with industrial strategy. When people hear the phrase, they automatically think about picking winners and that largely being a bad way for government to operate. We should look at the more recent iterations of industrial strategy. There is a big gap between the failed "picking losers" model of the 1970s and the slightly different approach that came to pass at the end of the Labour Government, through the coalition and into the industrial strategy released yesterday, which does not do that. Instead, it opts to pick the missions and challenges that government needs to focus on, from within which the conditions for supporting economic growth can be better understood. Whether that is procurement, regulation or spending on education and science, it allows the Government not to go so deeply into which firm or which place. I recognise that it still takes government into a territory that some find uncomfortable. Some find it a step too far.

There is no doubt that the industrial strategy has some supporters in the Treasury, but it also has a lot of opponents. An awful lot of people in the Treasury still think that this is not a phrase we should use, and that we should focus on productivity and the supply side. The point we made in the Industrial Strategy Commission was to focus on the strategic goals of the state. We thought a functioning health and social care system was part of that. That allowed us to step back a bit from the choice in this

strategy, which is to use X company versus Y company or X technology versus Y technology as a reason for supporting things.

We also recognise—this is particularly important for the life sciences strategy—that in many ways this is the best example of how much government is involved, compared to other sectors. You have NHS procurement; you have social care; you have virtually all the workforce training in health and social care through the NHS; there is regulation. In many ways, it is the perfect example of how deeply involved government is in this sector. We cannot ignore that or the potential it provides.

The Chairman: I know it is sometimes difficult to give a short answer, but I am only on the second question and we have many more to get through. I will ask my colleagues to be brief in their questions, and please give short answers.

Q172 **Lord Maxton:** I hope to be brief. Both of you spoke about this strategy being long term, but democracy itself is short term. The next election will be in 2022 at the latest. What is the impact of the fact that there might be a change of Government? Some of us hope there will be. What is the impact of the fact that you are long term and you are thinking long term, but democracy itself is short term?

Dr Hopkins: Happily, in this sector, the Conservative, coalition and Labour Governments have all shared a relatively long-term view.

Lord Maxton: The past Labour Government, you mean.

Dr Hopkins: There needs to be some sort of a non-partisan agreement. Once established, the industrial strategy needs to be allowed to run its course with the appropriate oversight and, going back to the previous question, the acceptance that winners are picked. In the commercial sector, R&D only has only a 10% success rate.[2] We have agencies such as Innovate UK that are already choosing industry and publicly funded projects.

Q173 **Lord Hunt of Chesterton:** I want to turn to the United States. I have not really thought about this question before, but we are talking about a situation in which 17% of US GDP is spent on this; here, it is 9%. If we spent 17% or the US spent 9%, the picture would be very different. Is it fair to make this sort of comparison when we have such an enormously different push of money into the whole sector?

Professor Westwood: It is a rather bigger figure if you put in health and social care, as it is a rather bigger proportion of the economy and the labour market as well.

Q174 **Baroness Neville-Jones:** We have not heard from our panellists what kind of people they would want to see implementing and monitoring. It

[2] Specifically, here, the reference is to the pharmaceutical industry-wide success rates for drug development – 90% of drug candidates entering clinical trials in humans do not lead to approved drugs. The success rate is higher in some areas such as infectious disease and lower in cancer.

seems to me this is quite a key question. What sort of individuals will these be? Are they going to be government officials? Are they going to be independent? What is the nature of their appointment?

Professor Westwood: Our recommendation was that they be independent from government.

Baroness Neville-Jones: What kind of people should they be?

Professor Westwood: At the risk of being self-serving, I suggest academics. They might be industrialists or Cross-Bench Peers, perhaps.

Q175 **Lord Oxburgh:** Sir John Bell suggested that one of our aims here should be four £20 billion-ish companies. Would he have made that proposal if he had read your document before he wrote it?

Dr Hopkins: I am not certain about that. I believe that my co-author sent him a copy of the book. But we have to look carefully at that goal, considering that in the US only 10 companies of that size have emerged since the mid-1970s and its sector is currently 10 times larger than the UK, in term of the public companies. We have one company that has grown to more than £20 billion, and it did so through merger and acquisition, primarily of drugs from overseas. Of course, a decade is a long time. It is possible that the pound could devalue to some extent, which might contribute towards making the goal of four companies with a value of £20 billion or more a lower hurdle. It is also conceivable that large pharmaceutical companies, such as AstraZeneca or GSK, could spin out large businesses, but it is certainly a very ambitious target as it stands.

Lord Oxburgh: I found your document and the histogram on the back very informative. Did you collect figures about the number of companies that failed on the way? That could be a significant difference.

Dr Hopkins: Yes. I am afraid that I am not in a position to compare US and UK failure rates. We looked at the number of UK companies that were founded and followed them over several decades. The total number of companies that failed completely, in terms of going into liquidation and so on, was relatively small. There were a lot of mergers that may or may not be profitable. On that basis, it is difficult to talk about absolute failure rates succinctly, without caveats.

Lord Oxburgh: If we look at your second group, the £50 million to £499 million companies, there is a significant difference. Proportionally, the UK is ahead of the US there. What happens at that stage? Do these companies simply cruise at that level? Are they subsumed or taken over by US companies and dropped into the next box?

Dr Hopkins: The chart shows that the companies in the UK industry are, on balance, rather smaller than the US companies. The US companies are able to raise more rounds of venture capital before they float on the public markets. When they arrive on the public markets, they are able to attract larger amounts of money. That means those companies, when they are well-capitalised, have many options. They can buy up other companies if their own projects run into problems. They can proceed

swiftly with their research and development rather than having to look continuously for new funding.

There are big advantages to being highly capitalised. The problem with UK companies has been that the UK was effectively building its innovation system when many of these companies emerged in the 1990s. US companies had the benefit of a more established innovation system with regard to venture capital and technology-friendly stock markets, for example.

When early disappointments came, UK investors burned their fingers and it was difficult to attract them back. We still see the scarring effects of those events in the late 1990s and 2000s on the sector, which led to a stunting of growth in some companies. Many companies have been bought up relatively early, because it has been difficult for their managers to find sufficient investment from the UK stock market. That is why, proportionately, the UK has more firms in the lower value categories than the USA.

Lord Borwick: Would a target of many hundreds of companies worth £100 million be better than a target of four companies worth £20 billion?

Professor Westwood: I would say so. That seems to fit our system rather better, but it depends on how you feel about larger companies absorbing them and a regime that either encourages that or defends against it. It seems to me that our system better suits that than the rather audacious goal of four global heavyweights.

Lord Griffiths of Fforestfach: I would like to ask Dr Hopkins a question. What lessons could an industrial strategy for life sciences in the UK learn from the US?

Dr Hopkins: In the US, a number of initiatives have provided steady support for the industry over many decades. SBIR[3] and STTR, for example, allow emerging areas of research to gain support to be translated into industry. The quanta of funds invested into those are larger than the average invested through Innovate UK schemes, for example. It is also important to recognise that we would find it difficult—in fact, impossible—to replicate the scale and diversity of the US system. With our European neighbours, we can build some initiatives at greater scale. Pan-European funding arrangements for research are the best example of that.

Lord Hunt of Chesterton: There are examples. Take the Met Office. Such is the position at the moment that the US Air Force gets its forecasts provided by the British Met Office. The calibre is not great. This is one of the questions. You mooted the question of whether the Treasury should be involved in big companies. If we go back to this notion of a set of smaller companies, worth £100 million or whatever, how would the Treasury or the governmental system participate in these smaller-scale

[3] This refers to the Small Business Innovation Research and Small Business Technology Transfer Programmes. This can be found at: https://sbir.nih.gov/about/what-is-sbir-sttr

companies? That is the question, really.

Dr Hopkins: In the area of drug development specifically—that is what my research has focused on, so I am afraid I mostly have to focus on that—companies of that size would really struggle. Clinical trials are extremely expensive. Companies limited to that capitalisation would inevitably have to be passing their projects on to commercial partners rather than seeking to develop these themselves and retain a greater interest in any associated revenues.

The Chairman: Is that why a lot of smaller companies get taken over? They cannot cope with the expenditure related to the big trials required.

Dr Hopkins: Absolutely, yes. In the past, we have seen this happen to many UK companies. In fact, the early monoclonal antibody drugs that were developed in the UK were brought to market by US companies, which then took the lion's share.

The Chairman: Yes, and that is now a business worth £60 billion a year.

Baroness Young of Old Scone: I am sure we will move on to this, but you are saying that we are probably on too small a scale to do the biz, whereas America is hugely bigger. There might be a middle course, which is Europe. Everybody from America says the NHS is such a huge advantage to us. Are you saying that we are still too small, even with the advantage of the NHS as a kind of testing ground, captive market and first adopter?

The Chairman: You might want to answer that, or you can hold your answer until Lord Mair asks his question, which is related to the NHS. Do you have a specific answer to Baroness Young's question?

Dr Hopkins: I will hold my answer and hear the next question, if that is okay.

Q176 **Lord Mair:** Just to enlarge upon Baroness Young's question, we received a lot of evidence indicating that the NHS is often rather poor at adopting new innovations. Why is this?

Dr Hopkins: This is quite a complicated issue. On the one hand, it is about pressures within the NHS; on the other, it is to some degree about the companies that are approaching it. Change requires slack in the system, particularly if it is profound change that leads to a change in a pathway of care. It is often not down to individuals in the health service, who might like to take up an innovation, to accomplish that alone. In some cases, it has to involve more systemic change. That can be difficult without the opportunity. In my research, I have seen that it is sometimes difficult in the NHS to do the adaptation, which requires local R&D initiatives, to bring a technology into use. For example, I have seen researchers finding it difficult to get operating-theatre time, given the strain for hospitals of meeting the requirement to treat patients in routine care.

There are some very well-supported centres, such as the BRCs. We have about 20 biomedical research centres in the UK. Of course, those places

will find it rather more straightforward to respond to opportunities, but there are many places in the UK that are not so well resourced. That will make uptake patchier. It is also complicated to get products and services into the NHS, because the NHS has to run efficiently; it has to resist innovations that might be dangerous. Companies may find that particularly complicated, particularly if they are relatively poorly resourced in themselves. Under those circumstances, we have to see looking after patients and ensuring that the NHS is protecting patients as an important priority. As I referred to previously with the Cancer Drugs Fund, in the past we have seen medicines taken up that do not have a great benefit.

Professor Westwood: This addresses the last two and, indeed, other questions about the NHS. The size and nature of the market it offers is an advantage. Government's relationship with that is also incredibly powerful in the context of an industrial strategy. But you are right: it does not do innovation particularly well. As Dr Hopkins has said, the pressures on service delivery, efficiency and saving money are rather more intense than the pressures on it for innovation.

Going back to the question about how American policy around this differs, Sir John Bell talks about the possibility of adopting a DARPA-like procurement function, HARP, to drive innovation equally strongly in the NHS. SBIR, which in the UK is SBRI, has had a go. Those smaller companies, albeit they are the ones that may suffer in certain aspects of developing technologies, treatments and services, struggle to get into that kind of innovation space within the NHS. Because of its other pressures, the NHS is not giving that as much of a priority as it might do, not just for company benefits, but for longer-term treatments and efficiency over a longer-term period. That takes us back to the short-term politics of the NHS, as well as the short-term politics of the industrial strategy.

Lord Mair: What should be done to improve the situation? We have heard what the problem is. Is the HARP one way of improving the situation? What would you both see as the best way to improve this situation?

Professor Westwood: HARP is a reasonably good idea, as is SBRI, from the evidence we have seen in the NHS. Ultimately, you have to give the NHS those objectives and you have to drive those through. This comes back to politics, and it equally applies to the politics of social care. You have to be able to say, "Look, over the next 10 years you can work differently. You can take some of these risks. You can think about the long term". We need to think about the long term to keep these organisations and services vibrant. Out of that longer-term thinking we can drive the kind of innovation that will support and develop the NHS and the services people want from it, as well as providing the right environment for companies to develop and get a slice of that. But it comes back to the long term.

Q177 **Lord Maxton:** You talk quite rightly about the NHS, but we have to remember that there are four health services in the United Kingdom. In

that situation, does devolution help or hinder?

Professor Westwood: The fifth is in Greater Manchester. It is around health and social care. It is a fantastic testbed for innovation. It is a risk: it is a public-policy risk; it is a financial risk; it is a service risk. But it allows us to trial new ways of doing things across those two important, complementary bits of the world, just as the other four do. Devolution allows things at a scale that would not otherwise be possible.

Baroness Morgan of Huyton: In a sense, that is what I wanted to ask Professor Westwood about. Collectively, we have a level of scepticism about whether the ambitions in the life sciences strategy involving the NHS are deliverable. That is partly because of funding, but also because of what you defined as slack in the system and delivering things that are measured. In recent weeks, a range of issues have come up. The ambition of your commission was arguably bolder than the current life sciences strategy. I wanted to ask you about Manchester, because that seems to be a testbed. Is that going to happen? To what extent is your commission linked in to health and social care in Manchester? While it should be a testbed, will it be a testbed to move any of this work forward?

Professor Westwood: We took a lot of evidence from people who are more involved in it than we are, including people in our own institution and across the Greater Manchester Health and Social Care Partnership, as it is called. It is not full-on devolution, as I am sure you know. There are still spending constraints, regulations and all sorts of other things. But it allows integration across the two. It allows the creation of innovation as a bigger driver within procurement, within that devolved-out bit of the market. It also allows consumers and users to dictate a little more to the service about what they want, which helps on the long-term issue. It helps on the politics. It might not always feel like that, but it helps to remind politicians—mayors are in power for even less time than Parliaments—that the standards of care and outcomes they want are different. In the Greater Manchester area, it helps to keep politicians' feet to the flame in a way that will ultimately be beneficial. It will encourage those in the partnership to keep thinking about innovation and doing things differently, because they know that they cannot sustain the service as they have set out to without doing that. That is quite a driver.

Baroness Morgan of Huyton: That is all "should do" or "would be sensible if they did". To what extent is that built into the devolution settlement in Manchester? To what extent is there any scrutiny of improvement in productivity or innovation? Maybe it is not a fair question to ask you; maybe we need to ask them.

Professor Westwood: There is more local scrutiny than would exist otherwise. It is still very early days in that sense, but there is a level of local scrutiny of services and outcomes. In some areas, there are quite poor outcomes relative to the rest of the NHS, and certainly poor standards for health outcomes and health inequality. It is part of the devolution experiment to see whether that happens. Because it is

consciously built in, I suspect there is a stronger innovation pull and push than there is at the broader level.

Q178 **Lord Renfrew of Kaimsthorn:** Can we look at the UK from a regional perspective for a moment? The Industrial Strategy Commission's report speaks of "regional imbalance". What is the role and importance of place for a successful industrial strategy?

Professor Westwood: We thought it was possibly the most important thing of all. Not that it took much studying, but we pointed out that we have one of the most unbalanced economies in the EU and in the OECD, and those gaps are growing. Those are economic, but they relate to health just as starkly. We felt the economics of regional inequality were an important focus, but we also recognised that the politics of regional inequality were driving things in a much greater way than has arguably been the case at any point over the last 30 years. That falls out not just from the last election but, obviously, from the EU referendum. It is very clearly in the objectives the Prime Minister has set for both the department for industrial strategy and this industrial strategy as a process. Officials from BEIS, the Treasury and others worked very closely with us. We are very grateful for that co-operation. In Greg Clark, BEIS has a politician who agrees with that diagnosis, which is partly why he got the job. We now have an industrial strategy that puts place as one of the five key objectives.

That said, it does not go far enough. In the commission, we went rather further on how much we thought could be achieved through more devolution. We talked about the idea of a basic infrastructure requirement across all parts of the country. One of the soundbites we used was, "You cannot put everything everywhere, but you need something everywhere". You need everyone in every part of the UK to see the tangible outcomes of an industrial strategy for it to be absorbed into the long-term political infrastructure of the country. We think it could have gone further; we would like it to have gone further. But we recognise that BEIS does not dictate everything that happens either within government or locally. Maybe that is one we can support it to do more on as the industrial strategy takes effect.

Dr Hopkins: To achieve critical mass, to have scale in the UK, it is important that we see a regional agglomeration or concentration in life sciences. That is what we see in the US, around Boston and Cambridge, which are neighbouring. There is a buzz about those places. Community incubators can be filled with companies that are similar and face similar challenges. They are more likely to perform better as a result, as the life sciences strategy sets out. Place is important. Skills and capabilities can reside regionally. Indeed, scientists may not want to or be able to move from place to place to place, following opportunities in different companies. I spoke to one individual in Boston who had moved from the UK out there. They had worked in six or seven companies in their career and they had never had to move their family because of the opportunities locally. We need to think about things like that.

Q179 **Lord Kakkar:** I want to turn to the question of Brexit and its impact on the life sciences sector in the United Kingdom. Do you believe the life sciences strategy will help mitigate some of those challenges? Is Brexit going to make it more difficult to deliver the life sciences strategy?

Professor Westwood: Let me try to answer that. Of course it makes it more difficult for some of the reasons we have been discussing: the size of markets and the like. It also goes back to the skills and capabilities within government. As we have experienced a bit of in this session, there are still very different views about how actively a Government should drive a sector like this. But there is no doubt that, if they wanted, this could have a very high priority within Brexit negotiations, if the Government thought about a particular model that they wanted to set out. That might involve a different regime around trials, drug development and those kinds of decisions. Consciously doing so would be more strategic. My concern would be that the level of strategic thinking is not quite there in the architecture around industrial strategy. It is not quite there in the negotiations thus far around Brexit.

Lord Kakkar: To be clear about this, would it be right for us to conclude that part of the drive for the overall industrial strategy has been to prepare the nation for what the opportunities might be post Brexit, but Brexit itself is going to impact on this life sciences strategy in such a way that its full potential is not going to be delivered as a result? Are there actions government could take to ensure that the full benefit of this life sciences strategy is achieved through the Brexit negotiation process?

Dr Hopkins: It is difficult to know just how great the impact of Brexit will be on the industry until we know the ultimate arrangements after Brexit. The more those arrangements depart from the status quo, the more incumbent it is on government to ensure the industrial strategy provides industry with the support to reform, reshape and try out new avenues, which may in time lead to chances for economic growth.

Lord Kakkar: Is the framework laid out in the current life sciences strategy sufficiently flexible to allow the life sciences sector and government to respond to what might be less than favourable outcomes from the Brexit negotiations for this sector?

Professor Westwood: I am not sure that any strategy can fully do that, just because of the wide variety of possibilities that might still come from it. Ultimately, the life sciences strategy—as the industrial strategy does—makes a pretty decent stab at doing that. They are the best options we have, but this still takes you back to what your strategic vision for this is. Is it a low-regulation, low-government role in industries such as this, or any other, or is it a higher model? We really need to resolve that issue to understand how to mitigate whatever the effects might be.

My view is that you go for a high-control industrial policy context to best do that. It still might be problematic but, particularly in life sciences, the NHS and social care, this is where government can do more than in most other sectors to try to mitigate those effects. For me, it is a perfect example of how active government can be, rather than of government stepping back and seeing what happens.

Dr Hopkins: In doing so, it is important to ensure that the patient benefits and there is trust and transparency in these new institutions. These new institutions need to be set up with the understanding that there will have to be an extended period of policy learning. There will be mistakes, failures in particular projects and investments in particular technologies that do not pay off. That is the uncertainty of research and development. It has to be accepted.

We need to hedge against that by placing many bets on a diversity of projects and even when individual projects are not successful we need to accept that the capabilities, experience and skills can be redeployed. It is not a situation where everything is entirely wasted with those failures. It will take a long time to develop the capacity in industry, universities and the NHS to have these people who can work across organisations effectively. Policy learning is important as well: we must have the cohorts of civil servants to support that. It will take time, especially as we have seen the decimation of staffing in BEIS in recent years. It will take time to rebuild.

The Chairman: Thank you very much indeed. Thank you for coming today to help us with this inquiry. It has been most helpful.