HOUSE OF LORDS

Science and Technology Committee

Corrected oral evidence: Engineering biology

Tuesday 15 October 2024

10.15 am

Watch the meeting

Members present: Baroness Brown of Cambridge (Chair); Lord Berkeley; Lord Borwick; Lord Drayson; Lord Lucas; Baroness Neuberger; Baroness Neville-Jones; Baroness Northover; Lord Rees of Ludlow; Viscount Stansgate; Lord Strasburger; Lord Wei; Baroness Willis of Summertown; Baroness Young of Old Scone.

Evidence Session No. 11 Heard in Public Questions 123 - 155

Witnesses

I: Lord Vallance of Balham, Minister of State, Department for Science, Innovation and Technology; Dr Isabel Webb, Deputy Director for Technology Strategy and Security, Department for Science, Innovation and Technology; Alexandra Jones, Director-General for Science, Innovation and Growth, Department for Science, Innovation and Technology.

USE OF THE TRANSCRIPT

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

Examination of witnesses

Lord Vallance of Balham, Dr Isabel Webb and Alexandra Jones.

Q123 **The Chair:** I welcome the witnesses to the committee's evidence session on the Science Minister's responsibilities in general. It is the final session of the committee's engineering biology inquiry.

We are delighted to have with us Lord Vallance, Minister for Science, Research and Innovation in the Department of Science, Innovation and Technology; Alexandra Jones, director-general for science, innovation and growth; and Dr Isabel Webb, deputy director for technology strategy and security.

The session is being broadcast on parliamentlive.tv and a transcript of it will be made available to you shortly after the meeting to make any minor corrections. If you think of any evidence that you did not get a chance to talk about or any data that might be useful to us, we would be delighted to receive that as formal evidence after the session.

We welcome you warmly and thank you for finding the time to give evidence to us so early in this new Parliament. We are delighted to have you here and delighted that you have made so much time for us.

I know that Lord Vallance would like to make an opening statement on the general science policy area. I wonder whether you could weave into that a response to this opening question. Now that you are inside government rather than advising government, what are your views on the role of the Science Minister, what are your key priorities, and what do you want to achieve having taken on this role? After this roughly 100 days, what do you feel you have achieved already, or at least kicked off? How is your experience of being Chief Scientific Adviser influencing your approach to being inside government? We are interested to hear what you have to say.

Lord Vallance of Balham: Thank you. I welcome this opportunity to meet with the committee. I will try to answer all those questions in my first few statements.

First, as I see it, it is very difficult or impossible to think of a single area of government policy or operations where science, technology or innovation would not make a difference. For a modern Government, that means that this has to be a very effective function. If you take healthcare, it is obvious, but it is equally true for housing, planning, defence and security, and education. It is a ubiquitous need. It is also, of course, incredibly important for the economy. Seven out of the 10 biggest companies in the world are

science and technology companies. They grow faster than other companies, albeit with some volatility. We know that countries that get this right do better economically than those that do not. So this is essential.

I would draw a distinction between the ministerial role and the government Chief Scientific Adviser role. One is advisory, obviously, but there is another distinction: the Government's Chief Scientific Adviser's role is to provide science for policy, whereas this role is clearly about policy for science. That distinction is rather important.

On my priorities for this role, I will outline five things. First, as a country that has been highly dependent on the knowledge-based economy and which is very good at science and technology, we must, as the economy allows, protect and grow the basic curiosity-driven science that we do in this country. I make that statement, because that work is ultimately the goose that lays the golden egg; it is what, in years to come, creates all the economic benefits and societal benefits. Yet it is not an area in which Ministers and others should try to determine what goes on. Academics, investigators and researchers should determine what they do in that area. We should protect and grow that pot as the economy allows, and do so carefully. By any measure, we do extremely well at it. Indeed, at the investment summit yesterday, a comment made repeatedly to me by many people was, "We love the fact that you are good at that in the UK". We need to get that right.

The second area is, of course, that we need to be as good, prepared and able as we can be to develop ideas that come from us or from elsewhere. So the "D" in R&D we need to be good at. That is a skills question and an infrastructure question. In this area, there is a legitimate role for government to say what the priorities are and what should happen. The industrial strategy and the missions become crucial. We need to be very clear about how we are going to structure that part of the system to be able to support all that.

The third area comes back to the economic growth story. We know that we have done well in this country, or better anyway, on start-ups—much better than a decade ago. We also know that we are not where we need to be. Although we do better than the rest of Europe and we are probably third only to the US and China in this, we have room for improvement. That is not bad, but where we are not doing well is in the scale-up of those companies. There are all sorts of reasons for that, which I am sure we will come to. That is my third area.

Then there are two lenses through which all this needs to be considered. First, this all has to be for the benefit of the citizen and society. It is about ensuring, as we undertake our policies and the operation of this, that we keep the citizen and societal need as absolutely central.

Finally, of course, this is crucial for resilience and security. It needs to be looked at both through that lens and from the international perspective.

Those are the five areas that I want to work on.

You asked what has been achieved in the three months or so since the Government have been in place. I will give some specific achievements in my patch and then talk a bit more broadly about DSIT. There have been some important funding announcements. UK Biobank has been given more money and is now able to have an important interaction with the private sector, with Amazon. Quantum hubs have been funded to the tune of £100 million. An MRC protein phosphorylation unit in Dundee got £30 million. That is incredibly important; it is a critical activity that has benefited industry and academia. Also, about £140 million has been spent on various medical research things, including five hubs for medical technology.

More specifically in relation to departmental activity, the Regulatory Innovation Office has been announced and we are now in the process of recruiting a chair for that. Work has also started on the national data library, but it is early days; there is scoping going on around that.

On artificial intelligence, there is a need to try to redress the balance to some extent, as there has been an almost exclusive focus on safety. Safety is important, but there is a huge amount of opportunity. The AI opportunities work that Matt Clifford has been asked to look at will report out shortly.

There are two other things. We have done quite a lot in these three months to try to rekindle appropriate relationships with Europe in science and technology, and, indeed, with the G7 Ministers. I attended the G7 Science Ministers' meeting in my first week in post. As you will have seen, I also decided to readvertise the UKRI CEO and Innovate UK CEO roles, not because we did not get good people in the first round—we did—but I felt that the job description did not adequately reflect the ambition for those two organisations. It also needed to take into account such things as the Government's approach to missions and industrial strategy. We needed to make sure that that was well reflected in the job

description. I am pleased to say that those processes are progressing well, and we have new applicants, as well as the old ones, in the system.

Q124 **The Chair:** Thank you. Some of those are very much topics that we will be coming back to. Given that the Government are so focused on missions, industrial strategy and delivery, how is it going for you in trying to persuade your colleagues that we have to protect and grow curiosity-driven research? How are you doing that?

Lord Vallance of Balham: To me, that is clearly something for the spending review next year, because it is a long-term question. Nobody has pushed back and said that it is not correct. Many people have said, yes, that is of course what we need to do. It is sort of what we have done but, in my view, we have done it implicitly rather than explicitly. I would like us to be explicit that this is an important part of what the UK should have, and that we should not neglect it.

Paul Nurse highlighted in his review that, yes, we are really good at that, but others are getting good at it too and we should not rest on our laurels. It is about making sure that that is visible and clear. As I have said, my view is that this is not an area where Ministers should be dabbling. It is an area where, as long as we are sure that we have the construct right to support it, the ingenuity, creativity and inventiveness of those doing the research should lead what happens. It is very easy to look at an area now and say, "Isn't that an important area?" It started 25 to 30 years ago when it was far from obvious that it was an important area. In my view, that is not somewhere that Ministers need to be.

The Chair: I think we would all support that. It is an area that Ministers should keep out of. But there is always the big question of how much of UKRI's budget should be devoted to curiosity-driven research and how much of it should be at the more applied end. That is probably a rather more difficult thing to think about.

Lord Vallance of Balham: It is difficult and essential, which is why it is on my list of things to do for the SR next year. We need to start being more explicit about that.

The Chair: We will look forward to hearing more about that, but you are not going to tell us now.

Lord Vallance of Balham: I do not know the answer now.

Q125 **Lord Lucas:** The science and technology framework requires action across the whole of government, on issues such as skills,

procurement, regulation and support for critical technologies. How do you persuade other departments to view supporting this as part of their responsibilities? What forums do you have to meet with them?

Lord Vallance of Balham: That is a very important question. When the framework was set up, it was precisely to try to get that all-of-government approach. The growth of science and technology, particularly company formation, is not solved by individual point interventions. It is solved by a systems-wide approach.

I am pleased that there has been progress on many of those areas. The Procurement Act due to come in next year will help. I have met with Minister Gould, the Minister for Procurement in the Cabinet Office, to try to make sure that that is fully tied into what we are trying to do. The missions present quite an interesting opportunity. There is an opportunity to link the procurement to the missions. Skills England is linked to us in relation to looking at what the skills will be for the high-tech and other industries of the future.

There are bilateral ways in which that happens. On the Regulatory Innovation Office, I am going to get together with the Ministers from other departments. I have already written to them to say that I want to meet on a regular basis to think about the areas that they cover, as many of the regulators sit in their departments.

Ultimately, of course, it is important that the Prime Minister has decided to have a Cabinet committee on science and technology. That is where the important cross-government bits of this can come, so that there is alignment and clear understanding of which departments are covering which bits.

Q126 **Lord Lucas:** What is your vision for the future of science in the Civil Service? What needs to be done, for instance, to make sure that we field good people in standard-setting? There are meetings where I have heard criticisms about low-powered teams being sent to really technical conferences. What needs to be done to improve the status of scientists, particularly science graduates, in the Civil Service? In what ways do we need to draw people in from outside? I would also be really interested to hear the thoughts of your two career civil servants.

Lord Vallance of Balham: I will ask them to come in at the end of these comments.

I am in danger of straying into my old job here. This is something that I was obsessed with as the Government's Chief Scientific Adviser. It is essential, for all the reasons I have given, that the Civil Service has an appropriate number of experts in both

engineering and science. I will give a specific example. In DESNZ, on the need for the energy transition, I am pleased that they have moved to a sort of mission control centre, which in my view needs to be packed full of engineers. They know that is my view, and I think they will bring in engineers to do that.

I am very pleased that the fast stream now has a target of having 50% with a STEM degree. When I started as the Government's Chief Scientific Adviser, it was 10% of the intake. So there is clear ambition to get that right.

There is also a need to provide tools for people. As well as having the right skills in the Civil Service, a greater use of data visualisation tools is incredibly important. That is what often brings this alive for non-scientists and non-engineers. Getting that side of things done is important; some quite significant advances have taken place there.

I will make one comment, which I have made previously to the Cabinet Secretary and the HR team in the Civil Service. We are never going to compete with the private sector on salaries. Let us not pretend that we can. We can do better in some places than we are currently doing, but we are not going to compete.

We can, however, compete on purpose, very much so. There is a strong desire to do things that make a difference to society. The AI Safety Institute can recruit top people at non-industry salaries because they want to do something useful. The one thing that is very important—it may sound trivial; it is not—is the speed of recruitment. If you do not snap people up quickly and get a very effective system for appointments, you will lose them, because something else will come up. It can be very fast. So the speed of recruitment process is an important part of this. Alex, you might want to come in here.

Alexandra Jones: This is something that we are taking incredibly seriously in DSIT, and I know that the Government's Chief Scientific Adviser is as well. As the second version of DSIT, we are now a digital centre—the digital centre of government. We have a whole range of expert skills that we have brought into the department as part of that. People are experts in their area. It has been very helpful to bring in different expertise and different ways of thinking.

We have a mix of ways in which we need to do this. Some of this is for the long term, such as the fast stream and the graduate programme—bringing people in early on, bringing their expertise and making sure that that is used. We also have an expert

exchange programme in DSIT, which is about bringing in people for shorter periods of time—recognising that this might not be their career but that they might want to contribute to a specific programme and bring their expertise, or we might want them. We actively go out; there is an ongoing secondment programme with some of our partner organisations, such as the Met Office and the NPL.

The other issue is how we incentivise the use of that science, engineering and technical expertise, so that we do not bring in the experts and not use the expertise by trying to force them into the way the machine always works. There are some really great examples of that in DSIT. I will hand over in a moment to my colleague, who I am sure will talk to you about how many PhDs there are in her team.

So there are long-term changes and the short-term bringing in of experts, and we are bringing in more and more people on the digital side. I do think there is something about how we make sure that science is part of the way of thinking. We have evidence-based approaches to policy and are asking for that technical expertise at the right points. We have a bit more to do on that.

Interestingly, neither of us are career civil servants. Both of us have had time out of the Civil Service doing different things. Being a civil servant is hugely valuable, because you move around so much and so learn a great deal. We are also seeing a mix of people moving in and out, which brings in some of the skills and the ability to use them differently. That will matter too. So we are not there, but I think we are making progress.

Lord Vallance of Balham: And Izzy is a great scientist.

Alexandra Jones: She is.

Dr Isabel Webb: I will not say too much more because my colleagues have covered it, but I am a biologist by training. I did a PhD before deciding that government could do with a few more people in it who understood science, and I decided to make the change and move into the Civil Service. I was one of the 10% of fast-streamers a few years ago, and I definitely felt like one of the minority when I joined. I have been passionate about this since joining.

DSIT is a really exciting place to be, because we are starting to attract those sciences and, when jobs are advertised, scientists are applying for them. I am very proud that the engineering biology team has a third bioscience PhDs in it, which is really exciting.

Across our tech and strategy team and our wider teams working on technologies we are seeing more and more people coming in from science and technical backgrounds in academia and in industry.

What is great is the support network that we get both inside the department and from the Government Office for Science and the science and engineering profession. That gives us a chance to meet other scientists, to keep cultivating those networks and to retain a link back to the academic and industrial worlds that we came from so that we can keep bringing in the expertise and stay on top of the most recent advancements.

Lord Lucas: That is very encouraging.

The Chair: It is great to hear that DSIT is full of scientists, but it would be nice to hear that of other government departments. If that 50% of the fast stream are all in DSIT, we are kind of—

Lord Vallance of Balham: If they were all in DSIT, DSIT would have to expand enormously. I agree with you that they need to be everywhere.

Q127 **Lord Berkeley:** There is very good news from you on that question, but do you have a similar group of experts sitting in the Treasury who understand what you are doing and support it?

Dr Isabel Webb: I could not tell you how many biologists there are in the Treasury, but I can certainly tell you that the real value of people coming in from outside the Civil Service is that we learn how to communicate our science in a really great way to help them understand. If you could not explain what science was, you probably would not be able to get a phosphorylation centre funded up in Scotland.

The real skill that scientists bring to the Civil Service is being able to break down those technical issues into much more simple ways, because you need the diversity of thought that comes from the other backgrounds as well.

Lord Vallance of Balham: When I joined the Government as Chief Scientific Adviser and started the agenda of increasing science in the Civil Service, a number of people came up to me and whispered, "I'm a physicist, actually, but I didn't dare tell anyone". I do not think it is like that now.

Q128 **Baroness Northover:** My question is about the industrial strategy. Generally, we very much welcome the fact that the Government are committed to having one. This was published yesterday. In many ways, it is a holding position; it is relatively general, and it is

pending wide consultation and a strategy council being set up and being in operation.

In that context, I want to ask you a few questions. There are certain things it mentions that would have been global challenges, such as the pandemic and the energy price shock. Then there are the UK-specific things, such as Brexit and the reduction of investment of 11% over three years relative to trend, which is UK-specific.

To what extent are the strengths that we are looking at here and which you are talking about built on events and developments prior to those things? I note what you say about not resting on laurels in terms of basic science, and what the strategy says in terms of jobs in renewables: that Germany has twice as many jobs in renewables as we do, Sweden has three times as many, and Denmark four times as many.

In the context of that kind of analysis and the general thrust going forward, how far will DSIT feed into this, and how will the science and technology framework that you developed before feed into this? In other words, what now, having issued this?

Lord Vallance of Balham: We are absolutely joined at the hip with DBT on this, and the officials work very closely together. We will lead on two of the areas—digital technologies and life sciences—and we have a science and technology input into every area, including ensuring that the science and technology framework is used as the basis of thinking about each of these sectors.

The thing about the framework, which, as you will probably be aware, was widely welcomed by industry and investors, is that exactly the same things will not be needed for every area—some will need more of one than of another.

The other point that will be important here is that in all these areas there is a risk with an industrial strategy that you simply support the current incumbents. One of our roles is to make sure that the emerging areas are properly understood and taken account of, because they may be the very high-growth areas of the future, and we will certainly do that as well.

The answer is that we are well plugged in. You are right that it is evolving, so there will be a fuller explanation of the whole thing, but we are involved both vertically, if you like, and horizontally in this.

Q129 **Viscount Stansgate:** What part do you see being played by the life sciences as part of the industrial strategy, or will the life sciences have their own sectoral strategy underneath a broader

industrial strategy? How is your thinking developing?

Lord Vallance of Balham: It is one of the eight vertical areas in the industrial strategy. Eight vertical areas have been described, one of which is life sciences, which will have its own—

Viscount Stansgate: —sectoral strategy along with it.

Lord Vallance of Balham: Yes. There is a life sciences council that will lead it. The point of the industrial strategy is to lay out the whole picture. Of course, each one will need its own special plan to deliver against that. Each sector is different, and there is overlap. That is why our need to have science and technology running across is really important, because AI, for example, goes across all these things.

Q130 **Baroness Young of Old Scone:** Thank you, Minister. Pressing further on yesterday's announcement, there is a series of priority areas laid out in it, although obviously that will be subject to further consultation. There were the priorities that you identified in the technology framework, and the missions. Do you think that people out there are keeping up, and what plans do you have, or what can be done, to have a degree of medium-term security about what the priorities will be for the future? Also, what comfort can you give to the folks who were in priority areas that are now no longer priority areas?

Lord Vallance of Balham: First, I completely back the notion of priorities for this. Also, as I said at the beginning, I do not think this applies to the basic curiosity-driven science that we are talking about. That is different; that has to be separate. So I completely think that prioritisation is right. I notice that the Institute for Government has been quick off the mark and published something on this already, saying that these are pretty much the obvious things you would go for, and he pulled out defence as the one that was new for them.

On the number of different things, I do not think there is a need for anyone out there to be worrying about the science and technology framework because, in a way, it is just a way of thinking about things. It is not a set of priorities; it is saying, "As you look at each sector, you must think about these things end to end and not forget one of them". This clearly falls under the No. 1 mission, which is growth. The growth mission is where the industrial strategy sits overall because it will drive investment and further growth.

The other missions are the priorities for the Government—and the Prime Minister has made it clear that they are his priorities—to

drive against and provide a coherent way of thinking about things across government. This is about joined-up government. There are really only two bits to think about: the industrial strategy as the sector areas and the missions as the outcome that the Government are looking for.

Q131 **Baroness Northover:** The industrial strategy document mentions migration. If growth is the No. 1 mission, but you reach conclusions on Britain's position on migration that might be politically unpalatable, how will you drive that forward?

Lord Vallance of Balham: I do not think it is for me as Science Minister to drive that forward, but there is a real recognition that this country has depended on high-skilled migration for many years and will continue to do so. I have visited quite a few companies since I started this role, and I do not think a single one has been populated at the technical, scientific level simply by people trained in this country. We are attractive for people overseas and we need to remain so.

The Chair: Some of us may be a bit intrigued by the industrial strategy, because it seems to cover everything; it is hard to imagine anything that you might not include under this incredibly broad range of advanced manufacturing, clean energy, creative, defence, digital, financial services, life sciences, and professional and business services. But a strategy needs prioritisation. Should we expect that as the next step?

Lord Vallance of Balham: As I said, this is a sensible list of priorities for a Government to have for their industrial strategy. We are a country that is highly dependent on a knowledge-based economy, so it is not surprising that we currently are or could be good at a lot of these areas. There will need to be a clear idea of what will be progressed within each area and how it will be done. As the industrial strategy is worked up and the industrial strategy council gets into place, there will be more flesh on the bones of each of these.

The Chair: Will there be a link-through from UKRI research, not the curiosity-driven research but the big part of UKRI that is about applied research?

Lord Vallance of Balham: Absolutely, there needs to be a clear link into this and the missions. This cannot be a rebadging of things that you might loosely fit under one of these headings. There needs to be a very clear system to do that. You are right that this is quite comprehensive in what it covers, but I can absolutely guarantee

that lots of people will think that they have been left out. That is inevitable.

There are some things that we can learn from the industrial strategy challenge fund, which was set up for the last industrial strategy. Some things succeeded in that programme and some things are definitely lessons for the future. For example, the requirement for a company to put money in at the same time as government meant that many of the applications were from big industrial primes rather than SMEs. We need to get SMEs deeply involved in this. We also need to make sure that the R&D work under this is timely in relation to the objectives. There is no point funding something to deliver in 10 years' time if we need to do something in five or three years' time. We need to get that urgency into the system and make sure that it is really clear what is required to deliver against this.

Finally, to go back to an earlier question, there needs to be a customer. In some cases, on the industrial strategy challenge fund, the customer was not entirely aligned with what was going on, so the department—or whoever it was—was not ready to catch the ball when it came out to be caught. We need to tie this firmly to what is required and therefore create some procurement signals.

Q132 **Baroness Neville-Jones:** I come to the dreaded question of money. The Government have said that they want to deliver certainty and flexibility to the R&D institutions and provide them with 10-year budget settlements, which is quite an innovation. Do you know when we are likely to see that in operation and how it will work, given that most other budgeting will be over a shorter framework? Are you optimistic that you will be able to do this?

One of the things that the industrial strategy framework says, rightly, is that in 10 years' time the economy will look quite different from its current shape. If that is true, how do you balance a 10-year settlement, presumably with objectives, priorities and people knowing what the money will be spent on, with being able to ride the change in technological priorities, with some things probably becoming much more important than they were previously and others taking a lower place? There are a lot of dynamics in this.

Lord Vallance of Balham: Thank you for joining me in my head on this. I have been thinking pretty hard about exactly these issues since taking up this post, and I will bring Alex in in a minute. I do not think 10-year funding is an easy, blanket solution. It needs to be targeted based on some clear principles. What are the principles that would make it more appropriate than some other form of

funding? How do you avoid the problem, which you described, that 10-year funding sounds great until year seven, when inflation and changes have caught up with you and it is a disaster? By definition, 10-year funding would in a sense be a floor, not a ceiling, because otherwise there would be a real problem there.

You have to think about the principles. We are working those up and Alex will say more about them. You can imagine that one set of criteria might apply to a world-class, undoubtedly well-run organisation that is doing really important, long-term and fundamental research that has been going for some time and which we know is going in the right direction. Why would you ask it to keep coming back every three years to get renewed when you could give it a longer runway to do things?

Another set might apply to an industrial sector that requires long-term partnership to achieve what it needs to achieve and where it is very clear that these are long-term solutions—you can imagine certain things in energy that might fall under this—where 10-year funding would provide some certainty for the industrial partner that it has something to work with. We are working on these principles and will come out and describe them and say which things fall into these categories. It will absolutely not be: "Don't worry everybody. You've got 10 years. Go away and get on with it".

Baroness Neville-Jones: In practice, does that not mean that the notion of 10-year funding will be rather selective and aimed at certain kinds of activity and institutions?

Lord Vallance of Balham: Yes.

Baroness Neville-Jones: When are we likely to know about this?

Alexandra Jones: This is a question for phase two of the spending review. Phase one has been focusing on this year and next year. Phrase two is more like spring. As the Minister says, we are talking through what the principles will be and how you select programmes and institutions. A great example is the Francis Crick Institute, which has some core funding over the long term. I am sure many of you have spoken to Paul Nurse about the difference that has made to its ability to design fellowships and programmes differently.

So there are examples out there. We have also done endowments recently, which are different from 10-year budgets but also give long-term certainty.

Baroness Neville-Jones: So core funding means that some things in the Francis Crick Institute might be funded on a 10-year basis

and other things might have quite different models.

Alexandra Jones: Those are existing examples. We are trying to explore what is most effective and what we are trying to do with the 10-year certainty. We are also looking at catapults, which are funded for five years outside the existing settlements. They have grant funding agreements. That means that they have a plan for those five years and we have an opportunity to review progress. They do not apply [for funding] again, but you have the ability to talk through how they are achieving it. They are not given something so specific that they cannot adapt to changes in technology, but we get a sense of what they might be trying to do. For something like the Crick, that is doing amazing research. For a catapult, it might be a bit more specific.

We are working through all the options. It cannot be the whole budget, because, exactly as you say, you will need to do too many things in the shorter term and to have too much agility. The principles by which you decide about an institution or a programme are exactly what we are working through so that we can be very clear about what would qualify, how you get it and the other approaches.

Lord Vallance of Balham: It will be selective, for the obvious reason that one of the things we need to do with the funding budget is create an opportunity to do new things and stimulate activities across disciplines, which come up during the course of a 10-year cycle. I would like to decrease the amount of committed funding that is given out. It is too high at the moment.

Baroness Neville-Jones: That might be music to Treasury ears. Has the Treasury bought into this approach?

Lord Vallance of Balham: We will look at it in SR25.

Baroness Neville-Jones: So this joy is still ahead.

Q133 **Lord Rees of Ludlow:** I would like to ask about the organisation of research at the micro level, in particular UKRI. We know that there have been some criticisms of the operation of UKRI in the grant report, for instance; those dealing with individual grants find it cumbersome and slow. You will be aware of this.

That leads into the more general question of the extent to which you as a Minister should be at arm's length from UKRI and the extent to which it is your responsibility to intervene. We do not want to see interventions in the appointments of heads of individual councils, for instance, as there were under the last Government. How much of that is appropriate? How much of a

general steer do you think the Government should give to UKRI?

Lord Vallance of Balham: I have already said that I asked for the post to be readvertised because I did not think the job descriptions adequately reflected what we were trying to achieve as a Government and it was important that they did so. I think that is an appropriate level to intervene at. I do not think it is appropriate for the Minister to start saying who should get that job, although a choice will come up to me from the appointments panel with recommendations that I will look at.

I made an early decision that the chair of UKRI should get on and appoint the non-executive directors who have been through the process and whom they want to appoint. I do not think Ministers should try to micromanage who does that. We quite quickly got the new chair CEO of the STFC appointed, because the process had all been done properly. I know from my 16 months or so outside government as chair of the Natural History Museum the frustration of getting these posts quickly through a sclerotic system. It was rather annoying, and I was very keen not to be part of that problem inside government. We will be much quicker on those types of things.

The role of the Minister and the department is to set the overall strategic direction, hold the board of UKRI, for example, to account for running things well and have some clear metrics by which they can be evaluated. It is then their job to make sure that the organisation does what it says it will do.

Q134 **Lord Rees of Ludlow:** I have two specific questions. Do you think it appropriate that Innovate UK should be under the same umbrella as the research councils, or does that make it too cumbersome?

Lord Vallance of Balham: That is a fundamental question about UKRI. My view, as I have said publicly many times before, is that UKRI should not be a research council on top of the research councils; it should be a strategic organisation that can accommodate within it a diversity of research funding approaches. I am concerned that a number of new, more innovative funding approaches got set up outside UKRI because it was deemed, probably correctly, that as it was set up UKRI did not have the ability to manage that diversity appropriately.

I am clear in the job descriptions that we sent out that UKRI is not a monolithic corporate organisation but something that ought to be able to have a mix of things underneath it, see the overall landscape, and understand where that can be greater than the sum of its parts and what it might do to facilitate that. That is the model

we need to work for. UKRI could fit perfectly happily in that model, because it is quite different from a research council—

Lord Rees of Ludlow: Innovate UK.

Lord Vallance of Balham: Yes, sorry.

The Chair: Could ARIA fit into it?

Lord Vallance of Balham: I think ARIA has got off to a terrific start, although I was a board member, so I have to be a bit careful.

The Chair: Can we learn something from it for how UKRI should work?

Lord Vallance of Balham: If UKRI got into the position I just described, you could imagine all sorts of different things sitting underneath it, working perfectly well, being left alone to do their own things and not having to be homogenised against everything else. That is the model we need to aim for. At the moment, I do not think anyone should touch ARIA.

Q135 **Baroness Willis of Summertown:** On a related point, I want to ask about Horizon Europe versus UKRI in grant funding in this country. I am delighted to hear all this about strategic direction, the 10-year funding bid and what will happen there, but I am still concerned about where pure research sits within all this. I sit on an ERC panel and have sat on NERC panels. The way the ERC looks at the more fundamental blue-skies research is miles apart from where we are in the UK and the peer review system. How does all this align within the new strategic direction that you are outlining?

Lord Vallance of Balham: I agree that the ERC forms a very important and different funding mechanism. It funds things that would not necessarily have got funded in the UK system, interestingly. That in itself is useful. A different, non-domestic group of people looking at things and giving funding is really important. This goes back to my opening statement about understanding what percentage of total spend we want to have on curiosity-driven research as a country with a knowledge-based economy and being explicit about that. That is where we need to get to for SR25 and be much clearer about it, because it would give the research councils the ability to understand where they can do things a bit differently and take risks on very early research, most of which has no obvious application at all.

Baroness Willis of Summertown: Is there a possible situation whereby that blue-skies research is funded via Horizon and the more applied or strategic direction of 10-year funding sits within

the UK central budget?

Lord Vallance of Balham: I would not favour that. We have to be doing that domestically as well. I am very pleased that the ERC does it also, and I strongly support having both those systems in play. I have chaired enough grant panels to know that, whatever you do, ultimately the domestic look is a bit different from the international look. You will always get a slightly different answer from the ERC than you would domestically.

Baroness Willis of Summertown: But there is a risk that that is how it will be perceived. This comes back to what percentage of the budget you think will be ring-fenced for blue-skies research.

Lord Vallance of Balham: I agree. Finding out what we do now is the first challenge.

The Chair: Are you worried that UKRI budgets might get cut in the spending review?

Lord Vallance of Balham: We are in the process of doing the spending review and my intention is to make sure that we get the best outcome for science and technology that we can.

The Chair: We will be very keen to support you in that.

Q136 **Lord Borwick:** In your opening statement, you talked a couple of times about addressing these long-term budgets "as the economy allows them to grow". Does that include, if the economy does not allow them to grow, reducing them? How fixed are these budgets? In government, you do not see long-term budgets other than for roads, defence and other capital investments that take more than a few years. They tend to have a habit of expanding rapidly, way above their original budgets, and the economy not allowing them to grow as much as the people in those projects would like them to. Do you see that as a danger of these long-term research budgets?

Lord Vallance of Balham: The demands on a science and technology budget will always be greater than the ability to deliver against it. That is normal everywhere. I am a realist. If the economy does not grow, it is very difficult to grow everything else. That is why a big focus of the more applied side of this must be on making sure that we get economic growth. As I said, my job is to make sure that the science and technology budget is properly protected and can grow.

Lord Borwick: Is that not likely to end up with even less agreement between scientists and politicians over what is practical? As you say, it will be defined fundamentally by what is happening

with the economy, yet it is being advertised as a long-term, fixed budget.

Lord Vallance of Balham: No, I want absolutely to distinguish between two things here. Curiosity-driven research is something that you just need to accept that you will fund; it is not 100% of the budget by any means, but we absolutely need to look after it. Then there are the things that are completely targeted towards government priorities. That includes growth as the No. 1 priority. We need to show politicians how you can use that to get growth. This is not something off to one side but a fundamental prerequisite for growth.

I have been in global companies and seen what they do. They often cut the R&D budget in times of stress, but those that do tend to go in one direction only—and not a good one. Those that maintain it and invest in it while making cuts in other areas tend to do rather well. AstraZeneca is a great example of that.

Lord Lucas: Where in your structure do you look for the drive and accountability to make sure that the technical quality of research improves over time, and that funding does not get stuck with consensus science and challenging ideas also receive a share?

Lord Vallance of Balham: That is a fundamental role for UKRI.

Q137 **Lord Rees of Ludlow:** To follow what Lord Lucas has said, do you think the balance of pure research between universities and stand-alone institutes is right or needs to shift? University staff, as you know, feel under more pressure and it is harder for them to get involved in long-term research. Do you feel that we need more stand-alone institutes, such as for the Faraday battery technology? Does one want more in that direction like the MRC institutes, because it is hard for universities, given the other pressures on university staff, to be internationally competitive in some of these frontier areas?

Lord Vallance of Balham: As you know, the relative split between those areas comes up time and again, so I will make a few comments.

At the investment summit yesterday, I was struck by the number of big global investors who were raving about the UK university system and how much benefit they saw in the research that goes on there. As you know, our system is quite different from those of France, Germany and other countries. It is very much based on research happening in universities. That is an important part of what we need to do.

Secondly, there is a logic to what happens in universities with teaching. I had the good fortune—I suspect this was true for you and many others—as an undergraduate to be taught by people who were extremely research active. That is important. There is something about seeing these people, interacting with them and being inspired by them.

Thirdly, some of our institutes are outstanding and we need to be very careful to make sure that they are properly looked after and get the chance to do what they do. I am absolutely not a fan of endless announcements of new institutes that apparently solve a problem but are not properly funded and cannot deliver adequately. We have to be very careful and make sure that, if we do institutes, we do them properly.

Q138 **Lord Drayson:** Last week, we heard evidence from several of those who were instrumental in the development of the Oxford AstraZeneca vaccine, in which you played a very important part. They told us how the UK at that time had the capability to move very quickly from the academic research being done on the virus into scale-up. They said that that capability has effectively been lost and that, "If Marburg gets out of hand, we are not in a great position". Have you in your first 100 days been able to make an assessment of the current preparedness of the UK to have a sovereign national capability, a stand-by ability, to scale up and manufacture a new vaccine?

Lord Vallance of Balham: I respectfully slightly disagree with the witnesses on how well we were placed in 2020. We were on the verge of absolutely not being able to do that. For decades, the vaccine infrastructure of this country had gradually eroded. We no longer had a major manufacturer of vaccines based in this country, even though we had the No. 1 vaccine manufacturer in the world—GSK—because all its facilities were overseas. We had lost capability in manufacturing and scale-up of vaccines. It took quite an effort to get that back in place.

It was fortunate that we had skills—many from people who had recently retired from the big companies but had the skills—and some facilities that we could repurpose and get going. We should not think that there was a very good situation at the beginning of 2020; there was not, but we were able to pull it together and rectify it.

There are now domestic manufacturers of vaccines. AstraZeneca is now a vaccine company in a way that it was not before, and we have BioNTech and Moderna—two new messenger RNA companies—based here. We need to keep looking at what the

facilities are. I had a conversation just recently about a vaccines facility that is part of the Cell and Gene Therapy Catapult and was acquired during the Covid times. There are facilities and it is important that we look at them and ask whether they are adequate.

I co-chaired the 100 Days Mission project with Melinda Gates for the 2021 G7, which laid out a plan to get to a vaccine, therapeutics and diagnostics within 100 days of a new pandemic or epidemic being identified.

One of the things that we were clear about in that report is that it is not a good idea to have standby facilities. In other words, if your facility is not being used the whole time, it is very difficult to get it to work properly during that time. You need facilities that are being used, so we need to make sure that we have a vibrant vaccine sector in the UK. That is our biggest protection against being inadequate.

Lord Drayson: Given that we lost our vaccine manufacturing capability through foreign takeover of UK production, how are you going to ensure that industry invests in an onshore UK manufacturing facility, given that we saw the national interests of Governments playing a big part during the Covid pandemic?

Lord Vallance of Balham: There is already an increase in domestic vaccine manufacturing, with AZ, BioNTech and Moderna doing things here. I do not have the answer to what we do long term, except to try and encourage the most effective vaccine industry in the UK that we can and make sure that some of that is linked to manufacturing. That is a key industrial strategy point that I am sure will be looked at in the life sciences sector of the industrial strategy.

Q139 **Lord Drayson:** You also highlighted two other points of concern. One was that the academic research on vaccines was dependent upon intermittent grant funding, which was very unsure, and that it was not being maintained with any sort of strategic oversight. I would be interested in your comments on that.

Secondly, there was a lack of clarity about where ministerial responsibility lay for preparedness to ensure that the UK has a sovereign capability in vaccine manufacturing. Using a defence analogy, if a foreign manufacturer that has a factory in the UK, the Government can make sure that the facility is used to make a vaccine to immunise the UK population.

Lord Vallance of Balham: On the point about grant funding, that comes back to the question of what constitutes longer-term funding

and why you would do certain things in different ways. That should definitely be looked at in this context.

On the point about where responsibility lies, this was exactly the challenge that we found in 2020, which was that it was benign neglect, if you like. There was not somebody who thought it was their job. The very last words of the module 1 report for the Covid inquiry quote something that I said at the inquiry, which is that you do not have an army because you expect to have a war every year.

You should think of this preparation in the same way: you need these things. But they have to be used. That means that industrial strategy needs to accept that part of what we do is stimulate a good vaccines industry in this country because we are going to need resilience in vaccines. Making sure that we have a plan for a successful industry is the best defence, rather than simply saying, "We're going to build a facility and it's going to be kept cold, but somehow it will miraculously be brilliant when a pandemic hits".

Lord Drayson: It is very fair to have a strategy but, to push my question, who is the Minister responsible for ensuring that strategy works?

Lord Vallance of Balham: For overall pandemic preparedness, it sits in the Cabinet Office with the CDL.

Lord Drayson: So with Pat McFadden.

Lord Vallance of Balham: Yes.

Alexandra Jones: Yes, that is my understanding. At DHSC, there are various contributors.

Lord Vallance of Balham: There is a group in the Cabinet Office.

Alexandra Jones: Resilience sits there.

Q140 **Lord Strasburger:** Good morning, Minister. The UK's strategic partnership with Moderna covers mRNA vaccines, but is not there a risk that we are putting all our eggs in the mRNA basket when what is needed is a range of technologies?

Lord Vallance of Balham: There is a much bigger risk, which is an historic risk and which I alerted the Government to when I joined in 2018, of putting all our eggs in the eggs basket, because the egg-based approach to vaccines, of course, is extremely risky, particularly if you get an outbreak of bird flu. So you are right: you need a range of technologies.

We are very fortunate in this country in that we have viral vector vaccines with the Oxford Vaccine Group, which is an outstanding group. We have messenger RNA vaccines, which, you are right, will be good for some things and no doubt not so good for others, and very good, by the looks of it, at least for the moment—we will see where it ends up—in cancer vaccines, which is very interesting. We also have traditional plants, and we have a significant manufacturing capability around Liverpool in this area.

So we have different technologies. You are right: you absolutely cannot look at it and say that messenger RNA is the answer to all vaccine problems. I do not believe it is.

The Chair: Is the Cabinet Office making sure that we maintain all those different capabilities? It is responsible for this.

Lord Vallance of Balham: It is responsible for overall planning for risk. DHSC has an accountability through UKHSA for those parts of pandemic preparedness. So the biosecurity strategy lays out who has responsibility for each bit of this system.

The Chair: Can we be confident that somebody is making sure that we have all these different routes available to us? I am not quite clear on that, I am afraid.

Lord Vallance of Balham: The answer is that the biosecurity strategy is looking at this, and that is in the Cabinet Office.

The Chair: That is where we will find this.

Q141 **Baroness Neuberger:** You have answered most of this question, but I want to ask you about the possibility of a peacetime vaccine task force—you will not be surprised to hear me ask about that—completely accepting that you do not want to go from a cold start, from facilities that are not being used. If you did need to scale up quickly, do we need some kind of peacetime vaccine task force that takes that on board?

Lord Vallance of Balham: UKHSA needs to understand how it would respond to any outbreak. I set up the 100 Days Mission to try to get global consensus and activity around what needs to happen. It now has strong international drive to make this happen. I am keen that the UK stays completely in the middle of this. The risk is that it would not have done because I was chairing it when I left. Now, UKHSA needs to make sure that it is fully plugged in.

For Mpox, UKHSA tested all the things that we tried to put in place and said, "Where are we on the 100 days for vaccines, therapeutics and diagnostics?" It published a very good update at day 45,

saying where we thought we had got to and which systems were now working and which were not. It exposed some weaknesses. The vaccines situation was pretty good, not least because the vaccines technologies are now much more programmable and therefore easy to switch into new things. Diagnostics were much better, particularly in the availability of PCR diagnostics but not yet for lateral flows for that. In therapeutics, we were lagging.

That is the big area in which we have a gap, which is mainly a technological gap. Messenger RNA and viral vector vaccines allow you to sort of instantly get something, but you do not have that for therapeutics. That is where AI comes in. It is true that AI is overused in all sorts of areas, but, building on what Demis Hassabis and John Jumper got the Nobel Prize for, that type of really serious AI applied to drug discovery will potentially be the thing that allows you to do a much more rapid dial-up for this type of approach. But we are not there yet. There is still quite a long way to go to get that right.

Baroness Neuberger: Okay, but you do not particularly want a task force.

Lord Vallance of Balham: There was something really galvanising about the way we brought people together to have a clear aim. There is a danger that a task force that you set up in peacetime might just drift a bit. It needs focus and for somebody to say, "I'm in charge of this", but I do not know whether a task force is the right answer. Alex, you might want to comment on this.

Alexandra Jones: It would need to be really clear what it did. Otherwise, the risk in all bureaucracies is that you create your own bureaucracy, perhaps not achieving the outcomes. There are organisations like SAGE, for example, in the Government Office for Science. To the Minister's point, it is an ongoing capability that gets used all the time. That is being tested. So there are different ways in which we prepare for particular events, do dry runs and scenario planning. Some of those routes are being looked at, and they are quite helpful ways. The task force needs to be really clear about what it will do, what the end point will be and what good looks like. Otherwise, it could become another part of the bureaucracy.

The Chair: I am sure many people will be reassured by some of the things you have said about UKRI. We are moving on now to questions related to our inquiry on engineering biology.

Q142 **Baroness Willis of Summertown:** Do you have a statement on engineering biology to make at the beginning?

Lord Vallance of Balham: Only that I have published a report saying that we need to take engineering biology very seriously.

Baroness Willis of Summertown: Good, but do the new Government plan to retain the strategy in the *National Vision for Engineering Biology*?

Lord Vallance of Balham: That strategy was put together following extensive consultation with industry and others. It seems like a very sensible thing to keep.

Baroness Willis of Summertown: What do you see as the key priorities of this sector? We have heard the most extraordinary set of evidence on this. As a biologist, there are so many aspects of engineering biology that I had never heard of before, so I am very interested in what you see as the priorities for the UK.

Lord Vallance of Balham: I will bring Izzy in on this as well. This is now reaching a stage where this is very real and is beginning to turn into the true idea of being able to programme biology to do all sorts of things, as you have heard. It is very advanced in some areas, such as medicine, and cell and gene therapies. We have got good infrastructure for that, and their needs will be quite different from some of the other things that I have seen over the past couple of months, like using cells to capture carbon dioxide to create a slurry, which you can take off and make into concrete. Things like that are early but quite exciting, as are biofuels from living organisms. At the most extreme end of early, in a sense, is the work of Jason Chin's Laboratory of Molecular Biology, which is creating totally artificial organisms able to do extraordinary things, potentially.

So we have a range of activities, each of which requires something a bit different. We need to fund the appropriate science, through things like the Laboratory of Molecular Biology and the various centres that have been created with the £100 million that went into engineering biology areas.

We need to create the skills. I was very impressed when I visited Science Creates in Bristol, which has had money from Innovate to do this. It is trying to take people from the university and help them to understand what it would take to take their ideas into something and train them. Imperial and other universities have similar as well. I think we are doing okay on that.

We have to make sure that the link between the biology and the AI is right, because it will be an important tool in all this, so we need to train people in that interdisciplinary area. The infrastructure

question also comes up. The biofoundries, of which five have been funded, have been really good; 49 companies have benefited from interaction with the biofoundries and there is some ability to scale up processing. So it is pretty good on the cell and gene therapy side.

The Centre for Process Innovation is really important in this system, and we will almost certainly need to do more. I am being a little hesitant about what more looks like, because we know from examples in other countries that creating a big infrastructure of stainless steel fermenters and so on, which sit there and do not do anything, is not a helpful way to do this. We need really to think about how to leverage private sector investment in the right places and what government money can do to make that happen, rather than assume that we know exactly what infrastructure we need as this really exciting area emerges.

Dr Isabel Webb: I do not have too much to add. We and DSIT are focusing on that foundational ecosystem, so we are pulling through that really exciting novel R&D, but also creating a landscape of the right skills, the right infrastructure and the right interventions around things like tech finance, and then working with the rest of government to make sure that we are pulling those exciting applications through to anywhere in the economy that they might touch.

It is quite heartening to read that list of eight sectors in the industrial strategy. The majority of them, perhaps not financial services, have really exciting applications, ranging from manufacturing to clean energy to defence and even to the creative industries, where we are seeing fashion handbags and dyes for clothes. For us, it is about trying to find that balance between creating an ecosystem where all the companies can thrive and then working with partners across government to pull it through.

Q143 **Baroness Willis of Summertown:** You mentioned DSIT again, but a lot of the engineering biology sits within Defra. How do you manage to bring those sorts of technologies and approaches into the thinking of these other departments?

Dr Isabel Webb: We work really closely with all departments in government that have equities in this. Defra is a critical example, as is the MoD, the Department for Energy and the Department for Business and Trade. We convene regularly. The engineering biology vision was not written just by DSIT; it was a truly cross-government document. We worked with all those partners, right from initiation, to make sure that we had the right focuses and areas. I hope you can see throughout the document a few different

examples of funding areas, like future food and future fuels, which have been pulled through.

Q144 **Viscount Stansgate:** I have a rather difficult question to ask you. Against a vast amount of investment by other countries like the United States, whose executive order has already allocated $2 billion to engineering biology and a share of the $280 billion CHIPS and Science Act funding over the next 10 years, do you ever find yourself wondering what we can do in this country at such a smaller scale?

Lord Vallance of Balham: There may be two different bits to this. If you look at the fundamental science in engineering biology, we are doing incredibly well. I have given the example of Jason Chin's laboratory, which is truly world leading on this and is making a huge difference.

We know that there are issues with scale-up, not just in this area but in many other tech areas. It is a perennial and really important problem that needs the full attention of the science and technology framework. So it is not just funding, although it is funding; it needs private sector funding. That is why the Mansion House pension reforms are an important step in the right direction. As you probably know, three of the major companies have now gone down the route of the Mansion House compact—I think Schroders, Phoenix and L&G. That is a great start that will unlock lock significant capital.

It needs regulatory approaches, which is why it is one of the areas that the Regulatory Innovation Office is going to look at and why £1.6 million went to the FSA to do a sandbox on regulatory approaches to engineering biology for foods. It is also why skills are such an important area, with doctoral training centres, the things I have mentioned at Science Creates and others, and why BBSRC has funded standards and metrology to try to get those skills levels right.

This is exactly where the science and technology framework comes into play, and we need to unlock private sector investment alongside it. This cannot all be government funding.

Viscount Stansgate: In your view, is there at least an appreciation that this is a really exciting area for the future? If we are going to make it work, this type of scale-up issue will be crucial and make the difference between a UK success in the future or another example of an area that we quote in 10 years' time, when we look back and say, "Why did we miss the boat?"

Lord Vallance of Balham: As you know, that has been true for a lot of areas over the past 50 years, probably. We cannot afford to do that again. It is why the letter that I wrote to the Prime Minister in my previous role, on behalf of the Council for Science and Technology, said that there is a "window of opportunity" to get this right. It is a relatively small window.

It is really important that the capital side of this is recognised. As you know, we lose a lot of companies in investment rounds of more than £200 million, as they go overseas. That is why the pension reforms are a critical part of this.

Q145 **Baroness Neville-Jones:** I want to comment on the evidence that you have just given. I have a strong recollection from the evidence of people doing engineering biology that they have two issues. One was not being able to afford the infrastructure and the cost of going to the laboratory. They were very specific about that. They also said that the regulatory scene was very disorganised and disparate and did not have much shape. That was beginning to become a problem, because, in its absence, it was difficult to create the notion of the industry and links between the various parts. That seems to me to be short of the scale-up problem, which—you are quite right—is one of our classic shortcomings. It does not really get them to the point of being firmly established as science start-ups. What do you think about that?

Lord Vallance of Balham: It comes back to all the angles of the science technology framework regulatory side, which is why it is one of the four areas that the Regulatory Innovation Office is picking up. The Regulatory Innovation Office is designed to do precisely that: to look at it and to ask, with a sharp focus, what things are preventing this emerging area from progressing, which regulators we need to bring on board, upskill, link with others, and enable with sandboxes, and how we can make sure that they have the appropriate ability to attract the rights skills into them. When we started the Regulatory Innovation Office, I was keen to focus on four areas in order to do four areas fast, not 100 areas slowly. If we can get some of these cracked, that example will pull other people to want it in their areas.

The cost of infrastructure, and access to it, goes back to my earlier answer. In some areas, like cell and gene therapy, we are quite good. It is in some of the non-biomedical areas where the infrastructure access is not where it needs to be for some of these companies scaling. The answer is also not entirely easy; just creating big infrastructure and hoping that someone will use it almost certainly will not work. It is something we are looking at

and will consider as we think about future funding opportunities, depending on the SR. Izzy, do you want to come in on that?

The Chair: We are coming back to infrastructure in a subsequent question, so perhaps we can save that and hear from Izzy then. Otherwise, when Lord Berkeley gets to his question he will have nothing to ask you.

Lord Vallance of Balham: I just want to make sure that an answer to a previous question was clear, which I think it probably was not. On the point about vaccines, the Cabinet Office is in charge of the biosecurity strategy overall. Whether we have the right vaccine industry is a question for the Office for Life Sciences. UKHSA has the more practical, immediate question of what we are going to do for a pandemic.

The Chair: And the OLS is yours.

Lord Vallance of Balham: It is mine and Minister Merron's.

The Chair: That gives us some reassurance.

Lord Vallance of Balham: I am quite focused on getting the industry side right.

Q146 **Baroness Neuberger:** The national vision identifies talents and skills as crucial for the engineering and biology sector. We have talked a lot in this committee about skills. What assessment have the Government made of the skills that are most needed, and what domestic training offers will be put in place to fill these gaps? It is a general question about what we are going to do here.

Lord Vallance of Balham: Implicit in the question is quite rightly the fact that this is an interdisciplinary problem. As I have said, there is a mixture of a very wide range of skills: biological, process engineering and AI. There are a lot of people funded by BBSRC generally, and there is some specific funding for Eng Bio which the centres for doctoral training in Bristol and Oxford put together. Advanced therapies apprenticeships are in place, as is a skills training network, which is more on the biomedical side. I was very impressed by some schemes that Innovate have put in place, such as the ICURe programme. At Science Creates at Bristol tech week I met people who are trying to bring people in and enable them with the skills needed to do not only the science, but the entrepreneurial bit.

We have training in some specific areas that I have mentioned, such as metrology and standards. It is quite a difficult area for this. I know from the time when I was doing cell and gene therapies

that defining the product is unbelievably difficult, because it is not like a chemical where you can absolutely define the product quality. So we have a lot of training to do across a very wide front. We have started, but I do not think we are there yet when it comes to what is required at the moment.

Dr Isabel Webb: I have nothing in particular to add. It just comes back to the difficult challenge of needing every skill. We need to work on the foundational STEM pipeline to see talent and skills coming through across the sciences, and then encourage people into this exciting technology.

Baroness Neuberger: I keep asking you this, but who is in charge?

Lord Vallance of Balham: Of the Eng Bio?

Baroness Neuberger: Of trying to pull this together.

Lord Vallance of Balham: I think it is us—

Baroness Neuberger: I was assuming it was, and hoping it was.

Lord Vallance of Balham: —even though, as Izzy pointed out, there is obviously work going on in Defra and in DfT.

Q147 **Baroness Neville-Jones:** One problem we encounter in a lot of settings is the issue of visas. I do not think I need to rehearse the arguments for you; I am sure you are pretty familiar with them. But we are dismayed by the immigration health charge, all the upfront costs faced by somebody who wants to come here to work, and the small number visas that are available. The salaries they get here are quite modest compared with some of the places they could otherwise go.

You said that you had been to hardly any company or activity where there was not a large number of non-Brits. That is a very cheering thought. Nevertheless, their willingness to come and work in this country is not absolutely guaranteed against the background of these very high initial costs, which are deterrents.

How do you rate the prospect of being able to change this policy? Can you have a dialogue with the Home Office about this, with the aim of realising a national ambition to increase the number of talented people who come here, rather than putting them off?

Lord Vallance of Balham: On the cost side, it is important that those costs can now be met on Horizon and UKRI grants, so there is a way to get someone funded if they are working more than 50% on the grant. They can get the cost covered.

The Chair: Does that include the health surcharge cost?

Lord Vallance of Balham: Yes, it does. Many, but not all, of the charities have also agreed to that. It is not a panacea, but there is a way forward. The global talent visa numbers increased from about 7,000 in 2023 to 8,000 in 2024, which is a 16% increase. So it is moving in the right direction. As you might imagine, I have been very clear that this is an important thing to get right. I have had discussions with the Home Office and others, and the Migration Advisory Committee is looking at the skills needs in different sectors and will continue to provide advice to the Home Office.

Baroness Neville-Jones: Thank you. We wish you the best of luck.

The Chair: Yes, good luck in your discussion with the Home Office.

Q148 **Baroness Young of Old Scone:** Perhaps when you are talking to the Home Office, you might also like to raise the issue of families not being able to be brought over. I notice from the Migration Advisory Committee's latest data that there has been a huge reduction, which it is putting down to the fact that families can no longer come. Have you had a look at those figures?

Lord Vallance of Balham: I am aware of those figures. I know it is something that the Migration Advisory Committee will continue to advise on and the Home Office will keep under review.

The Chair: Can we expect some more doctoral training centres in engineering biology? In its evidence, the UKRI told us that the fact that there are only two in engineering biology was a positive first step but insufficient to meet demand. So I think that it recognises the need for more. Is that something we can hope to see?

Lord Vallance of Balham: We are in the middle of a budget review at the moment. We have one now and one in spring next year. We will be arguing for the best we can get for the science budget, and this is an area that it is important to continue to develop. UKRI will use its budget to try to support the priority areas, and this is a priority.

Q149 **Lord Drayson:** You have already highlighted your concerns about the UK's ability to scale up our strength in the early-stage sciences. This is something that the previous Government also identified, and you have mentioned Mansion House reforms. I am really interested in what the new Labour Government are doing on top of the already announced measures to address the very serious problem of the rate at which we are continuing to lose capital from the UK, and the decline in the UK London Stock Market. What are the

Labour Government doing differently to address this urgent problem that the UK has, which will be central to solving the productivity and wealth-creation problem that we have?

Lord Vallance of Balham: There was a very large investment summit yesterday in London on exactly this topic, and the atmosphere there was rather pro-investing in the UK, which I was pleased to see. There were several comments about the need to attack the areas that I talked about, including regulation as a way to make it easier for people to see the pathway. That is why, again, the Regulatory Innovation Office is so important. There is the procurement situation, which is why I think the Procurement Act will make a difference. There is the industrial strategy, so you have a clear line of sight in sectors, as well as some of the underpinning abilities to go across with the technologies that are needed. All those things are going to matter. That will create an environment in which investment will be more likely. Of course, the national wealth fund exists to try to help with some of that co-investment, and there is the BBB growth fund, which was announced yesterday.

There are lots of steps in place. I am not going to tell you that it is a panacea, and we know that more needs to be done on the pension front. Mansion House is great, but probably not enough on its own. We know that there will be a question about how employers take up that offer of DC pensions in that fund, because we need to get lots of people into it. My view is that if I was fortunate enough to be in my 20s or 30s now, I would want my pension fund to be in this high-risk and high-return area. We have to get that bit of it right as well.

There is a whole reason why this is a cross-government activity. It is not a single intervention that is going to make a difference.

Q150 **Lord Drayson:** That issue of pensions being invested in high-tech, high-risk activities is still a major debate in the investment community and the City, and pension funds do not universally support the idea. However, I am quite interested in comparing your 20 to 30 year-old self and those 20 or 30-something technology entrepreneurs today who are considering whether to list their company in the UK or in the United States. What would you say to them as to why they should consider listing their company in the UK?

Lord Vallance of Balham: I will make one point before I answer that. I am also keen for Innovate, UKRI and others to look at the join-up. There are too many examples of companies that have had a good start with an Innovate grant, have a little bit of venture funds from somewhere, get some sort of product or close to some

sort of product, and then there is absolutely no procurement pull. We need to get both ends of this system right.

What I would say to the entrepreneurs—and have said, because I been around and met a lot of them—is that the actions that the Government are taking are more than just saying that we will put a bit more grant funding in, because that is not the issue. They involve regulation, procurement, unlocking scale capital and co-investment from government where it is appropriate to do so. We have examples where that has been shown to work. The national security strategic investment fund has done that and has shown that government can play a role in making this happen.

There are some schemes in place now that should create greater optimism about the ability to keep companies in the UK. Fundamentally, as you will know better than anyone, this requires private capital. Governments for years have highlighted the importance of procurement in enabling scale-ups. Often, as you have highlighted in the new industrial strategy, a number of the markets are effectively controlled by the Government—for example, defence and health.

We have heard evidence to the committee that the risk-averse culture in government, the unwillingness—unlike in the United States—to place an order for a capability prior to that capability having been proven, is what is holding back the ability of companies to go from that early start-up phase to scale-up. What will the Labour Government do differently to address that risk aversion in the procurement process?

Lord Vallance of Balham: The Procurement Act will make it more possible to take that risk. A clear indication of risk appetite from Ministers is important. Let me explain what I mean by that. If you look at what happened during the time of the Vaccine Taskforce, there was no need for a single change in regulatory rules or procurement rules in order to create a system whereby both regulation and procurement were pro-innovation but it required clear and unambiguous ministerial oversight.

I have said this publicly, so I will say it again: it is likely that if the Vaccine Taskforce had failed, which was the most likely outcome at the beginning, it would have been slated as a waste of public money and a terrible thing for somebody to have done. That is the thing that drives conservative behaviours of not taking risks on the approach we take to investment and procurement. We have to get that risk appetite right as part of this, which is precisely what is behind some of the new things that have already been announced and the intention of the industrial strategy.

Q151 **Lord Drayson:** In evidence from Dr Clive Dix, who, as you know, took over the Vaccine Taskforce from Kate Bingham, we heard a clear sense of concern that the aversion to risk in the Civil Service had led to a return to risk-averseness after the disbandment of the Vaccine Taskforce, and a sense of the deep-seated cultural aversion that exists in any Administration. That is not to criticise civil servants but to say that the rewards do not come from taking risks in the Civil Service. So how are the Labour Government going to address that in the Civil Service?

Lord Vallance of Balham: It is a matter of ministerial clarity on the risk profile that is acceptable, the Civil Service believing that, and the National Audit Office and the Public Accounts Committee understanding that innovation inevitably comes with risk. I have spoken to the board of the National Audit Office on this very topic, because I have been so concerned about it. It assured me—this is before I became a Minister—that it would audit against the risk profile that was stated at the outset.

In other words, if you said, "This is a portfolio risk, and we understand that nine out of 10 things are likely to fail", that is the risk profile the NAO will audit against. That has not been put to the test and it is very important that it is, because the first time a risk is taken and an investment goes pear-shaped, which it will, and somebody then gets hauled in front of various committees to explain why this ridiculously stupid thing had been done when it was so obvious to everybody it would fail, the risk appetite would be right down to the bottom again. This is something for all of us to be aware of, and it is a massive behavioural change that is not easy at all to get right.

Lord Drayson: All power to your elbow in achieving that. It would be interesting to hear from your colleagues as to whether they feel, 100 days in, that there is any sense of a change.

Alexandra Jones: We have been looking quite a lot at this in DSIT, as you would imagine, given that innovation is in our job title.

There are a couple of examples where changes are happening. Some started some months ago. The Willetts review looked at business cases for R&D, as the current system incentivises you to be very risk-averse in how you put together a business and economic case, and how you approach it. It means that you take a very long time to procure some technologies that have, by that point, moved on.

At the moment, we are piloting a new approach to business cases, which we are talking to Treasury and other colleagues about. There is real interest across government. That is one of the ways in which you can define some guidance that says what good looks like, and that good looks like going a bit faster, taking more risk and taking a different approach. That is a way in which you bake in the incentives for civil servants and others: this is how you do it; this is what good looks like. I think there is some progress there.

We are certainly having conversations about risk appetite in DSIT and more broadly and about how we learn the lessons from where we have set something up to try take risk, but it has been hard for people to do so. I can give the example of innovation accelerators, where we were taking a portfolio approach to investing in programmes. That is not procurement, but it is a stage before. There were some lessons to be learned about how senior leaders ensure that more junior people taking those decisions were absolutely backed to take those risks.

The final thing I would flag is that the NAO has heard some of the messages and is very keen to explore what incentives are sometimes created by a concern about what the NAO might say, rather than what it does say. So there is a lot of behaviour just in case; this happens in the bureaucracy review and elsewhere.

Specifically on business cases, we are learning some of the lessons and talking about risk appetite, and then having those conversations with the NAO. None of that is going to solve the issue, but it starts to get to the incentives and behaviours.

The final area I would flag is what gets rewarded and celebrated, because, if you do not see somebody taking a risk and it perhaps failing, then people saying, "That was a really good thing to do; what did you learn?" it will be very hard to do this.

Lord Vallance of Balham: The NAO has been really responsive on this.

Q152 **Lord Wei:** Welcome, Minister, to your role. I declare an interest, because I am an adviser to a number of venture capital funds and have written reports on how we can increase pension funds and institutional money into start-ups. I know that a lot of what I wanted to ask has been covered already, so I want to zero in on the scale-up challenge and note that some of the feedback coming from the pensions industry and others, as this post-Mansion House world evolves, is about how you rightsize the risk appetite of trustees, pension funds and so on with the amount of capital that they have to help scale up British companies.

For example, as you probably know, there is a real trend in the pension industry to outsource a lot of activity to the likes of Schroders and others. Alternative investments are increasingly managed by larger managers, to the point when the amount of money they have may be too big even for scale-ups. It might be easier to do private equity or other, bigger infrastructure projects. What do you see the Government doing to address these issues? There are also issues such as liquidity; pensions often need to know the value of their portfolios and that has challenges.

To follow up on this new national wealth fund and Innovate UK, are there roles that they can play to address some of these barriers? How are the new Government thinking about that?

Lord Vallance of Balham: You are stretching my limit of expertise quite far. I am not an expert on the details of pension funds. I am aware, because I was involved in some of them, that there were many discussions on whether the right model was to get big fundholders to create a new joint fund, which would be able to take the risk, with a few per cent from everybody all in one pool. That is not the route that we have gone down; it is 5% of individual funds.

I am well aware of the importance of the scale of funds, because you can expose a small fund to this degree of risk if it is going to cause problems with liquidity. There is something about the consolidation of pension funds; it became important to solve that in the Canadian system. But I am in danger of becoming a super non-expert describing things that other people know better than I do.

Lord Wei: What do you see as the Government's role in trying to help grow this market generally? Is there a strategic role that the national wealth fund can play?

Lord Vallance of Balham: Both the BBB growth fund and the national wealth fund are designed to help unlock some of this capital. With their expert colleagues, they will work out the right way to do that.

Q153 **Lord Berkeley:** Minister, you have been making some very interesting comments. I want to go back to infrastructure but, before I do, as the role of the NAO in procurement is fundamental, I hope you will add your voice to others who have said that it needs to be properly staffed and resourced to do it. The NAO has made a few cut-price changes over the years and it needs to be done properly, from the bottom up.

You have told us a great deal about infrastructure and engineering biology, but we took some evidence about a lack of pilot-scale facilities, which some people found. Equally important is a lack of

knowledge about what research and development facilities are available. Many good announcements were made yesterday, but I hope that communications to people who might want to use it will be beefed up, because we have had a lot of comments from people who are saying that it is difficult to know what is going on.

Lord Vallance of Balham: We are trying to make everything on engineering biology as open and clear as we can. A group of experts comes together to look at this and we will continue to try to get that information out there. As I have said, in my opinion, this is a very key area for the UK.

Q154 **Baroness Young of Old Scone:** I thought I heard you say that you did not think that government investment in significant infrastructure was the answer and that it very much needed to be in partnership with the private sector. We have heard from many of our witnesses, who have been saying that it is at that next stage, when they need to do something for real, at a pilot level, long before they get into a big partnership with another organisation. That is the sticking point for them.

Lord Vallance of Balham: I agree and want to be clear: that is what we have done on cell and gene therapy, and that is exactly what happened. The CPI also offers that. My point is not that we do not need to do more of that but that we need to be really careful not to end up creating a big infrastructure that sits there not being used. That is the experience from other countries, and we have spoken to them about it. We need to do this at the right level, and I recognise that gap. The private sector increasingly recognises it. The number of private sector investors who are thinking about investing that sort of infrastructure is quite interesting.

Lord Berkeley: Baroness Young is absolutely right. The Minister said earlier that he did not want to see a lot of facilities, with lots of polished, stainless steel things, sitting doing nothing. If you want to take this forward, how are you going to do it? It is partly private sector, but the public sector has a role—partly in finance and partly, as I said earlier, in identifying what might be available.

Baroness Neville-Jones: It seems to me that a lot of universities have rather elderly infrastructure. Can we not combine to benefit them as well as us?

Lord Vallance of Balham: We are looking at this in engineering biology. I am not going to commit today to exactly what facilities will be in place, but I recognise this, and we know that it needs to be part of how we think about our overall spending review outcome and that it is important for the community.

The Chair: I stopped Dr Webb from talking about infrastructure earlier. We should give her the chance to say what she was going to say then.

Dr Isabel Webb: I will probably repeat a bit of what has already been heard. We know how complicated this is. It is not simply a case of building a fermenter and that is what people need. They need different fermenters and other bioprocessing facilities of different sizes. In fact, downstream processing, once you have grown up your bacteria, fungi or whatever other organism, is as critical and so variable, depending on whether you are going for medical grade, food grade or chemical grade.

The facilities here are not simple. Since the vision was published, we have spent a huge amount of time assessing the evidence, working with the Government Office for Science in particular to help bolster that evidence-building and make sure that we are accessing all the expertise. We are now in that really focused window having assessed what is out there and might be needed and looked at the international models. I know you spoke to BioBase Europe in one of the earlier hearings, and you heard about what the US is doing around BioMADE. We have been doing a huge amount of evidence gathering so we can really think through what is right for the UK. Then, as the Minister said, we will need to get through the future spending rounds before we are able to talk about any kind of public investment.

Lord Berkeley: You know it all and you have told us all about it, and you are obviously very good at it, but are you going to tell everybody else?

Dr Isabel Webb: We will do when we are able to.

Q155 **Viscount Stansgate:** Are you developing a sense of where, in the engineering biology landscape, the right ecosystems exist to scale up and where you need to take further action?

Lord Vallance of Balham: You mean subject areas.

Viscount Stansgate: Yes. For example, in areas involving artificial fuel, maybe with chemical companies and fuel companies, we already have the elements that are required, but perhaps not in other areas. Are you beginning to distinguish which areas will need further help?

Lord Vallance of Balham: I have tried to allude to that. Things are in quite good shape in the cell and gene therapy thing. There are bits that need doing, but lots of the right things are in place. Looking at foods, the regulatory side has been a big block, which is

why the Food Standards Agency has got a sandbox to try to help free that up. In carbon-capture mechanisms and fuels, there are some quite good things, although is definitely a scale-up issue there that needs to be looked at. There are specific things in different areas where we understand the landscape and are trying to help out.

The Chair: I think we felt that there needs to be a pull on some of this. We can see the pull in the life sciences area, but we were slightly concerned by the evidence session with one of the big chemical manufacturers. We did not feel that, in the chemical and fuels area, we were seeing the kind of pull yet that meant that you could do that work in the UK and get the benefit to the UK economy, rather than the early stages looking at how we might make synthetic fuels. We were worried the technology might go overseas if we did not have the whole of the ecosystem pulling on it from both ends in the UK.

Lord Vallance of Balham: I agree.

Baroness Young of Old Scone: It is really important to think about the impact on land use in this country from the point of view feedstock requirements. It will be no good, when it comes to fuel security, if we develop a technology that needs imported raw materials to be created.

Lord Vallance of Balham: If only these things were easy.

The Chair: Thank you very much.