

PARLIAMENTARY DEBATES

HOUSE OF COMMONS
OFFICIAL REPORT
GENERAL COMMITTEES

Public Bill Committee

ADVANCED RESEARCH AND INVENTION AGENCY BILL

First Sitting

Wednesday 14 April 2021

(Morning)

CONTENTS

Programme motion agreed to.
Written evidence (Reporting to the House) motion agreed to.
Motion to sit in private agreed to.
Examination of witnesses.
Adjourned till this day at Two o'clock.

No proofs can be supplied. Corrections that Members suggest for the final version of the report should be clearly marked in a copy of the report—not telephoned—and must be received in the Editor’s Room, House of Commons,

not later than

Sunday 18 April 2021

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The Committee consisted of the following Members:

Chairs: JUDITH CUMMINS, MR PHILIP HOLLOBONE, † ESTHER McVEY, DEREK TWIGG

† Baker, Duncan (<i>North Norfolk</i>) (Con)	† Onwurah, Chi (<i>Newcastle upon Tyne Central</i>) (Lab)
† Bell, Aaron (<i>Newcastle-under-Lyme</i>) (Con)	† Owen, Sarah (<i>Luton North</i>) (Lab)
Blackman, Kirsty (<i>Aberdeen North</i>) (SNP)	Richardson, Angela (<i>Guildford</i>) (Con)
† Butler, Dawn (<i>Brent Central</i>) (Lab)	† Solloway, Amanda (<i>Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy</i>)
† Crosbie, Virginia (<i>Ynys Môn</i>) (Con)	† Tomlinson, Michael (<i>Lord Commissioner of Her Majesty's Treasury</i>)
† Fletcher, Mark (<i>Bolsover</i>) (Con)	† Zeichner, Daniel (<i>Cambridge</i>) (Lab)
† Flynn, Stephen (<i>Aberdeen South</i>) (SNP)	
† Furniss, Gill (<i>Sheffield, Brightside and Hillsborough</i>) (Lab)	Sarah Ioannou, Seb Newman, <i>Committee Clerks</i>
† Hunt, Jane (<i>Loughborough</i>) (Con)	
† Mayhew, Jerome (<i>Broadland</i>) (Con)	
† Metcalfe, Stephen (<i>South Basildon and East Thurrock</i>) (Con)	† attended the Committee

Witnesses

Tris Dyson, Managing Director, Nesta Challenges

Professor Dame Ottoline Leyser, CEO, UK Research and Innovation

Professor James Wilsdon, Digital Science Professor of Research Policy, University of Sheffield

Professor Mariana Mazzucato, Professor in the Economics of Innovation and Public Value, University College London

Professor Philip Bond, Professor of Creativity and Innovation, University of Manchester

Public Bill Committee

Wednesday 14 April 2021

(Morning)

[ESTHER McVEY *in the Chair*]

Advanced Research and Invention Agency Bill

9.25 am

The Chair: Before we begin, I have a few preliminary announcements. Hon. Members will understand the need to respect social distancing guidance. In line with the House of Commons Commission decision, face coverings should be worn in Committee unless Members are speaking or medically exempt. *Hansard* colleagues would be grateful if Members emailed their speaking notes to hansardnotes@parliament.uk. Please switch electronic devices to silent mode. Tea and coffee are not allowed during sittings.

Today, we will first consider the programme motion on the amendment paper. We will then consider a motion to enable the reporting of written evidence for publication and a motion to allow us to deliberate in private about our questions before the oral evidence sessions. In view of the time available, I hope that we can take these matters formally, without debate. The programme motion was discussed yesterday by the Programming Sub-Committee for the Bill.

Ordered,

That—

(1) the Committee shall (in addition to its first meeting at 9.25 am on Wednesday 14 April) meet—

- (a) at 2.00 pm on Wednesday 14 April;
- (b) at 9.25 am and 2.00 pm on Tuesday 20 April;
- (c) at 11.30 am and 2.00 pm on Thursday 22 April;
- (d) at 9.25 am and 2.00 pm on Tuesday 27 April;

(2) the Committee shall hear oral evidence in accordance with the following Table;

TABLE

<i>Date</i>	<i>Time</i>	<i>Witness</i>
Wednesday 14 April	Until no later than 10.25 am	Nesta; UK Research and Innovation
Wednesday 14 April	Until no later than 11.25 am	Professor Philip Bond, University of Manchester; Professor Mariana Mazzucato, University College London; Professor James Wilsdon, University of Sheffield
Wednesday 14 April	Until no later than 3.00 pm	Defense Advanced Research Projects Agency; Wellcome Leap; Professor Pierre Azoulay, MIT

TABLE

<i>Date</i>	<i>Time</i>	<i>Witness</i>
Wednesday 14 April	Until no later than 3.45 pm	Professor Dame Anne Glover, Royal Society of Edinburgh (formerly); Tabitha Goldstaub, CognitionX
Wednesday 14 April	Until no later than 4.30 pm	The Royal Society; Royal Academy of Engineering; Confederation of British Industry
Wednesday 14 April	Until no later than 5.00 pm	David Cleevely, Focal Point Positioning Ltd and the Cambridge Science Centre; Campaign for Science and Engineering

(3) proceedings on consideration of the Bill in Committee shall be taken in the following order: Clause 1; Schedule 1; Clauses 2 to 7; Schedule 2; Clauses 8 and 9; Schedule 3; Clauses 10 to 15; new Clauses; new Schedules; remaining proceedings on the Bill;

(4) the proceedings shall (so far as not previously concluded) be brought to a conclusion at 5.00 pm on Tuesday 27 April.—*(Amanda Solloway.)*

The Chair: The deadline for amendments to be considered at the first two line-by-line sittings of the Committee, on Tuesday 20 April, is the rise of the House tomorrow.

Resolved,

That, subject to the discretion of the Chair, any written evidence received by the Committee shall be reported to the House for publication.—*(Amanda Solloway.)*

The Chair: Copies of written evidence that the Committee receives will be made available in the Committee Room and circulated to Members by email.

Resolved,

That, at this and any subsequent meeting at which oral evidence is to be heard, the Committee shall sit in private until the witnesses are admitted.—*(Amanda Solloway.)*

9.28 am

The Committee deliberated in private.

Examination of Witnesses

Tris Dyson and Professor Dame Ottoline Leyser gave evidence.

9.29 am

Q1 The Chair: Before we start hearing from the witnesses, do any Members wish to make declarations of interest in connection with the Bill? Nobody has given notice that they would like to do that. We will now hear oral evidence from Tris Dyson, managing director at Nesta Challenges, and Professor Dame Ottoline Leyser, chief executive officer of UK Research and Innovation. Before calling the first Member to ask a question, I remind all Members that questions should be limited to matters within the scope of the Bill and that we should stick to the timings in the programme order agreed by

the Committee. We have until 10.25 am for the first witness session. Tris Dyson, please introduce yourself for the record.

Tris Dyson: Good morning. My name is Tris Dyson. I am the founder and managing director of Nesta Challenges, which was set up in 2013 by the UK Government in partnership with the innovation foundation Nesta. Its explicit purpose is to develop UK expertise in challenge prizes as a funding model for frontier innovation. We have grown significantly over that period of time and are now something of an export; we design and develop challenge prizes for Governments around the world in North America, Europe, Africa and so on, and for companies and foundations. Essentially, the model looks at where you can stimulate innovation and new activity to create new markets, new opportunities and to solve important societal problems.

Q2 The Chair: Thank you. Professor Dame Ottoline Leyser, please introduce yourself for the record.

Professor Leyser: Thank you. My name is Ottoline Leyser and I am the CEO of UK Research and Innovation, which is an arm's length body of the Business, Energy and Industrial Strategy Department. We are the major public sector funder of research and innovation for the UK. We fund right across the disciplines and sectors that conduct research and innovation.

Q3 Chi Onwurah (Newcastle upon Tyne Central) (Lab): Given that this is my first contribution, may I say what a pleasure it is to serve under your chairship, Ms McVey? I look forward to working with all members of the Committee on the Bill, which is important for our future research and prosperity.

I welcome our two witnesses. I have one general question for both of you, given your broad range of experience in research and development: what is the problem that the Advanced Research and Invention Agency is fixing? Professor Dame Ottoline, do you have a clear understanding of the proposed working relationship between ARIA and UK Research and Innovation, and should that be put on a formal footing to provide clarity? Mr Dyson, Nesta Challenges is based on challenges, so what is the role of challenges and missions with regard to the work of ARIA in driving high-risk, high-reward research?

Professor Leyser: I do not actually see ARIA as being about fixing a problem; I see it as adding something new and extra to an already very high-quality research and innovation system. As I have said, UKRI is the major public funder for research and innovation. We invest £8 billion of public money every year in research innovation, and we have a major responsibility to act as stewards for the whole system in the UK to ensure that it has the right capabilities and capacity to conduct the research and innovation that we need for the kind of inclusive and sustainable knowledge economy that is so important for our country.

As CEO of UKRI, I have to think about all parts of the system. I have to think about the people—do we have the right kinds of people in the system, the right mix, the right diversity, the right set of skills, and the right career trajectories and pathways through the system? I have to think about infrastructures—do we have the right balance of institutes, universities, catapults and national facilities, as well as high-quality equipment

within institutions and universities, for example? Are we funding the right mix of ideas, starting from the really high-risk, high-gain research, which will be the focus of ARIA? It is also our responsibility to fund the really important work that perhaps does not fall into that transformative, high-risk, high-reward category, but without which the benefits of that high-risk, high-reward research will not be realised and the foundations for the next transformative ideas will not be built. I also have to think about the connectivity in the system, how to join it up and make it all work effectively. Then I have to think about how we can take that and focus it on particular challenges that we face in the country. The work that UKRI does seeks to balance all of those needs and support all of them to create a really high-functioning system for the UK.

I hope that ARIA will do what you might call an extreme or particularly transformative, visionary version of that focus activity, so it will work in a different way from the way in which we typically work. Because of our incredibly broad responsibility for the system, we tend to work in a way that asks the system, in a very broad and open way, how it can best deliver the things that we think need to happen, whereas ARIA will work on the programme manager model, so it will identify a small cadre of visionary leaders who will have extraordinary ideas, we hope, to drive forward the edge of the edge, transformative, visionary ideas, and they will hopefully be empowered to work in very different, agile ways to take forward those kinds of ideas. That is quite experimental. They should be able to experiment with different ways of funding research, including, for example, the challenge model, which Tris is such an expert on. There is a whole range of opportunities. That is how I see it working. It is a small, agile agency that will bring together these visionary individuals to add something on top of a very high-functioning system. It is not about fixing a problem; it is about adding something new at the edge of the edge to push forward those frontiers.

I absolutely agree that it is very important that activity is properly rooted in the research base for which I and UKRI are responsible, because it will depend totally on that research base. The people employed at ARIA will absolutely need to understand deeply what UKRI is doing and what the opportunities are across that research base in order to deliver their vision. I would expect a very close working relationship with ARIA to allow that to happen.

Tris Dyson: I would agree with quite a bit of that. Nesta Challenges produced a report in the summer called “The Great Innovation Challenge”, which we should share with you. We looked at the funding ecosystem. The current funding ecosystem is pretty good and our main funding mechanisms work quite well. It is not wasted. It includes direct financial support through bodies such as UKRI and also the Small Business Research Initiative. It also includes research and development tax credits and the effect that has.

There has, however, as I think the Government have recognised, been an overall need to increase funding in research and development, which is why the target of 2.4% and the promised increases in Government funding are so welcome. In that context, we think that there is an opportunity to explore new avenues and do things slightly differently. Some of the opportunities that that presents, both through ARIA and more generally, is

around boosting the diversity of people involved in frontier technology and innovation and improving geographical reach. If we do have a long-standing problem in the UK, it is perhaps with that feed-in to commercialisation and the connection between university R&D and patenting and things that get picked up by the private sector, so that might be something to look at. We do not think that there is a problem, but I guess that this does present, as Ottoline has said, an opportunity for a new, smaller, dynamic agency to add to the current ecosystem.

We think the advantage of ARIA would be that, because it is smaller, it might be able to generate a culture that is a bit more nimble and a bit more agile, take some more risks, look at things about diversity of innovators, and engage with types of innovation and types of innovation funding that ordinarily might be perhaps a little too high risk. It can also be a little more focused and entrepreneurial, but—to consider the second part of the question—it can also look beyond just grants and R&D tax credits, which are overwhelmingly the main way of funding innovation in the UK.

On the role of challenge prizes, challenges get used quite loosely to mean a lot of things, but what we mean by them is outcome-based funding, where you use the combination of technology foresight and insight with some creativity and understanding of how markets evolve and develop, and what opportunities might exist in the future, in order to identify quite specific problems, where there is a real ability to push things forward in innovation but where it is unclear where the most promising innovation is going to come from. For ARIA, I think that this might be quite a useful tool, because, comparatively speaking, you are dealing with relatively small amounts of money, and outcome-based challenge funding gives you a degree of focus but also allows a degree of payment on results. So, you have milestone payments on the basis of ability to solve problem A, B or C, or of demonstrating some traction in the market.

They have other benefits as well, which go beyond the non-financial. You can use relatively smaller amounts of money in a challenge prize model because you might be building up a deal flow for investors, customers and other people who you want to crowd in and bring in additional funding. They are also quite high-profile because of the nature of the competition or the race towards solving x. That means that the publicity and the promotional opportunities for innovators can be quite significant, above and beyond just the financial reward.

Q4 Chi Onwurah: Thank you very much for those responses. It is great to hear such support for our existing science base. A lot of the discussion around the Bill has been critical of the bureaucracy associated with current research, which has served us so well, particularly in this pandemic.

Both of your responses referred to the role of ARIA in looking at new areas, particularly having new areas of focus that may have been missed and addressing them in different ways. The document of intent that the Secretary of State published leaves the choice of areas of research or the overall mission to the programme managers rather than the chief executive of ARIA, whoever that might be. How will that address our country's research needs, and do you think that the Secretary of State should have responsibility for identifying the overarching missions that ARIA looks at?

Dame Ottoline, there has been controversy with you over exempting ARIA from meeting freedom of information requests. UKRI meets freedom of information requests. Do you find them to be burdensome in going about your objectives, and what proportion of your budget is taken up by them? I will go to Tris first this time, if that is okay.

Tris Dyson: I think that the question about leaving it up to the team that is put together at ARIA is a very good one. When you ask people about the US Defense Advanced Research Projects Agency, the US Advanced Research Projects Agency and so on, you get quite different answers as to what they do—that is probably because they do so much—but one of the common responses is that they have very empowered programme managers who understand and know their fields and are able to pursue agendas with a degree of freedom.

I think that has got to be a model that an agency like this—if it is going to be higher risk-taking and a bit more agile, and is going to look at funding innovation that you might ordinarily overlook—needs to be able to pursue, but it does mean that you need to get the right team in place and empower them appropriately. That means that you need a combination of, obviously, people who understand frontier science and technology; but then you also need a degree of creativity and insight as to what the opportunities might be. You need people also who understand the strengths and abilities within the UK, in order to build on that. So, yes, we are significant advocates of the idea that you would have a small, dynamic, empowered team; but they will also need to be relatively ruthless to stop funding things that do not work quite early on, and stick with things that do. That will have to be a mindset, or a regimen, that is baked in from the start.

Professor Leyser: I absolutely agree with what Tris has said. I think it is widely acknowledged that the success of ARIA—and in many ways the rate-limiting factor—is going to be finding those people. The whole ability of this organisation to operate in this edge-of-the-edge really visionary way that we are all very excited about is critically dependent on those people; and they are in very short supply. So I think the idea of leaving it open to that team of people to decide their focus, to pick the projects that are at the edge of the edge, as it is described, is a really important element.

I also view the notion of this small, agile additional agency as having that freedom in a very positive way. The needs of the country—the priorities that the Government and Ministers set to solve particular challenges for the nation—fall very much within the UKRI remit, and indeed we have very successful programmes doing exactly that, including in a challenge-led model. Those programmes tend to operate on a slightly different basis in the more traditional open call route that Tris describes with grant applications and so on. Again, I would see ARIA as an additional small, agile, free agency that can creatively identify and capture those transformative opportunities that, indeed, are not necessarily thought about in the broader system, and reach parts of the system that our current system does not as successfully reach. It needs to be very experimental and I suppose from that point of view it is not the place where you invest the responsibility for delivering major national priorities.

We are very committed to our freedom of information responsibilities. We get about 30 requests a month and we have a team who deal with those requests and also the other data access requests, and so on, that are part of our responsibility. I am happy to be able to do that. I think that is important for public money, and there is a judgment call about the burden of administration of that, relative to the benefits in transparent use of public funding.

Chi Onwurah: I will stop there, because I know many Members have questions.

The Chair: I will go to the Minister, and then to Stephen. Can I have an indication—will Members put their hands up—of how many there are? That is four. If you want to ask another question, do you want to ask it now, or come back a little bit later?

Chi Onwurah: I will come back later, if that is okay.

Q5 The Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy (Amanda Solloway): May I say what a pleasure it is to be here under your chairmanship to discuss such an important subject, Ms McVey? I have two separate questions for both the witnesses. The first question, for Tris Dyson, is about funding mechanisms and how they support the R&D system. Do you have some examples of how a range of funding mechanisms support the R&D system?

Tris Dyson: We put together a document in the summer, which we can share with you, that has examples both from Nesta Challenges and particularly from the United States of outcome-based challenge prize funding. That is obviously mainly the space that we occupy. There were some great examples of where it stimulates and creates whole new industries and sectors. There were also some examples of where there can be quite big mistakes, because you go off down the wrong course.

I know there has been quite a lot of inspiration from DARPA and from the US. One example would be the driverless car in the early 2000s. DARPA ran a series of challenge prizes in the desert around the development of driverless cars. It was literally an annual race where teams from universities would compete to develop vehicles that would outperform one another, and there was prize funding associated at the end of it. That is more or less where driverless cars began. The teams that came out of those universities and the individuals have now been picked up by Google, Uber, Apple and everybody else. It is why a lot of that frontier technology is now being developed on the west coast and the rest of the world is playing catch-up.

Another example would be the Ansari X prize, which was about building a privately funded spaceship that would carry two passengers. It had a very specific target about how high a sub-orbit it needed to reach within a two-week period. That created an enormous race for people to build privately funded spaceships, again in the early 2000s. You can see now what has happened in the private space flight industry in the US. The team that won that is now Virgin Galactic and we see every day in our newspapers what has happened to them.

We are a bit newer to this in the UK, but we also have some examples. We concluded a challenge prize just before Christmas that was looking at lower-limb paralysis. It was essentially saying that there have been dramatic improvements in the fields of artificial intelligence, robotics

and sensory technology but why has the wheelchair not changed very much in the last 100 years, except for electrification? That was a global challenge in partnership with Toyota that resulted in some amazing breakthrough systems and products for people with lower-limb paralysis all around the world. A Scottish team called Phoenix Instinct won. They developed a wheelchair that moves with the user, anticipates movement using AI and sensory technology, and has a very lightweight alloy frame that is quite revolutionary from the perspective of a wheelchair user. Those are some examples.

Whether you do a challenge prize or not, I think you would need to do the same thing with ARIA, which has got to focus on areas where there is the most opportunity and where you have a decent hypothesis that technology pathways can be developed in order to solve that problem and encourage activity around that singular thing. That is the whole premise of missions or challenge prizes.

Q6 Amanda Solloway: Thank you, that is really helpful. My next question is to Dame Ottoline. We acknowledge that there is clearly a role for ARIA, but I think it is important that it does not just fund the usual suspects. What are your thoughts on this? How will ARIA be able to target people and ideas that are not picked up through the current system, for example that UKRI is able to target?

Professor Leysler: Absolutely. I think that the kinds of examples that Tris has just talked about are quite illustrative from that point of view. Typically, the way the current system works is that we would put out a call for applications in a variety of contexts. It might be a completely open call; right across UKRI we run these so-called response-paid funding competitions where people with ideas about what they want to do can apply for funding to do them, whatever they might be. On the whole, those kinds of applications are the sort of bread and butter of really established research organisations: universities, institutes and, through Innovate UK, businesses. A lot of them are also collaborative with industry. It is that kind of grant application process that then goes through peer review, and we try to pick the projects that, as an overall portfolio, will best deliver what the UK needs, both in the short term and, absolutely, in the longer term, building that capacity and capability.

It tends to be established organisations that know the system and how to apply for those kinds of projects, and which have the structures available in their organisations to do that. With ARIA, however, I think there is the opportunity to test a much wider range of models, such as those kinds of competition-type prize approaches that Tris described—he is an expert in those. There is also a fairly well-established system called Kaggle for coding competitions, for example. That potentially reaches a much wider range of people. You do not have to apply; you do not have to have a system that can support that kind of application process. The funding flow is very different: it is a response to the results; it is the winner of the competition. As a result, it may be possible to reach a much wider range of people. In that coding space, for example, there are really extraordinary people working in their homes as freelance coders who would find it very difficult to access the classical UKRI and most of the funders that there are currently.

I very much hope that we would be able to tap into some of the talent right across the UK that is not in the more established places. That would be one really exciting

outcome from this with that prize model. Where you have a really clear objective—so it is really clear who has won the money, so to speak—it is possible to do that in a way that does not automatically engage the kind of financial management systems that we have to use. For example, are we sure that this money is being spent on what the applicant said it would be spent on? If you are giving somebody the money for having done the research or having delivered the outcome—the car that goes across the desert—you are in a very different situation.

I do think there is a very interesting possibility for ARIA to reach those people who are talented and can contribute in ways that it is much harder to with the standard systems. I hope that we would learn from that and be able to import some of that expertise into the standard system when it was established and really clear that it was providing good value for money in a robust way.

Q7 Stephen Flynn (Aberdeen South) (SNP): Thank you Dame Ottoline and Mr Dyson for your answers so far, which have been incredibly informative and helpful. I want to pick up on a couple of things that you have said. You have both mentioned the benefits of a small, agile agency. I guess that raises the question of whether £800 million is a sufficient budget for that small, agile agency. To pick on something that you said, Mr Dyson, about ARIA being quite ruthless in terms of stopping the funding of things quite early on, what would you expect the failure level to be, and how do you expect us all to measure in a reasonable way the success or otherwise of ARIA?

Tris Dyson: Well, more money is better. I think this money needs to be deployed intelligently, so being quite clear on the missions and the focuses is really important. It is even more important with a still significant amount of money but relatively smaller sums. Getting those areas right is really important. The examples that were just given about Kaggle and databased approaches are potentially a useful avenue for some of this, because the R&D investments and sunk costs are relatively low as opposed to building spaceships or something like that. That would be the sort of calculation you might need to make.

You can also use leverage. One of the areas that the UK has been pioneering is around regulatory sandboxes, for example, through the regulators' pioneer fund, which is administered through UKRI. But some regulators, off their own backs, have also been setting up and developing sandboxes that allow innovators to play with datasets in an environment where the regulator is giving them a little bit more permission than they might have had otherwise. That in itself is an incentive, particularly when you are playing around with datasets.

You can think of examples where we have got significant strengths. One of the things we have talked about a lot during the pandemic—more recently, at least—is the UK's strengths in genomics research. That means we have got an enormous range of data that could be made available to people through the likes of Genomics England, which in itself is an inducement or an encouragement above and beyond the financial. So being clever—boxing clever—with the money is important.

In terms of ruthlessness, part of this comes to the culture. The ARIA team will have to establish a culture where they trial things out, set targets and objectives and have constant reviews where they get together and

decide whether to kill things off. That is clearer when you have defined missions or objectives that you are working towards. It is much harder when you are fostering lots and lots of different things—it is hard to compare X with Y.

Professor Leyser: From my point of view, the question I would ask is not so much how much money should ARIA have but what proportion of the public sector R&D spend should go into this way-out-there, high-risk, transformative research-type project and, of that, how much should be in ARIA. It is a proportionality question and, as Tris said at the beginning, at a time when there is an aim to drive up UK investment in R&D to 2.4%—hopefully beyond that, because 2.4% is the OECD average and I think we should aim to be considerably better than average—that is quite a stretch target for us. We do incredibly well—the quality and amount of research and innovation in this country is extraordinary—given that we currently invest only 1.7% of our GDP. So I think the opportunities to build that really high-quality inclusive knowledge economy, given how well we perform in the R&D sector with such a small proportion of R&D, are incredibly high.

On that rising trajectory, with us aiming for that 2.4% and beyond, I think spending a small proportion of that on this edge-of-the-edge research capacity and capability is the right thing to do. I would look at the budget in that context as a percentage of the overall R&D spend. People have been comparing the current ARIA budget with the budget of organisations such as DARPA, but if you look at it as a percentage, you get a very different number because, obviously, the US spends a much higher proportion of their—anyway—bigger budget on R&D than we do. That is the important question from that point of view.

How will we know that it has succeeded, and what would one expect the percentage failure to be? I agree with Tris that it is incredible difficult to predict. There is also serendipity and other things to factor in. If you set yourself a fantastic target of solving a particular problem or producing a particular new product and you fail to do that, none the less, along the way you might discover something extraordinary that you can apply in another field.

That high-risk appetite feeds into the question, again, of how much money or what proportion of the overall R&D portfolio should be invested in that way. One has to think about risk in R&D in that portfolio way. It is considered generally in investment markets that really high-performing investment portfolios are a portfolio. You invest in stuff that you know will deliver in an incremental sort of way, and then you invest in the really high-risk crash or multiply parts of the system. That is very much how one has to think about ARIA.

In that domain, where you have a very high probability of failure—that is what high risk means—but also an extraordinary probability of amazing levels of transformative success, it is a dice roll. The total number of projects will be relatively small, so it is very hard to predict an absolute number or proportion that one would expect, and one should not need to—that is what high risk, high reward means.

The Chair: Thank you, Dame Ottoline. We have just under 20 minutes. Members need to be around the horseshoe to ask a question—there is a microphone on the corner. I will tell you the order in which I will ask

questions, so those who are not in the horseshoe can get there. I will go to Daniel Zeichner first, Stephen Metcalfe second, Dawn Butler third, Aaron Bell fourth, Virginia Crosbie fifth and Chi Onwurah at the end. If anyone else would like to ask a question, please indicate.

Q8 Daniel Zeichner (Cambridge) (Lab): Thank you, Chair. It is a pleasure to be on this Committee. I will be brief. Good morning, Dame Ottoline. I would like to pursue the funding question. Governments have long had aspirations to raise the level of R&D, but it proves incredibly difficult to do under pressure of circumstances. Things seem to have changed, in the sense that over the last few months we have seen considerable pressures on UKRI budgets and ongoing uncertainty about the cost of being part of the Horizon programme. Given that there is lots of uncertainty, if you had £800 million to spend in the coming period, would you spend it on this?

Professor Leyser: That is an excellent question. Clearly, the economic circumstances of the pandemic have made the choices the Government have to make about where to spend the money extremely challenging. Having said that, the opportunity thrown up by the pandemic and the instabilities put into the system as a result of the extraordinary circumstances make now an extremely good time to invest in that R&D-led recovery and to build that inclusive knowledge economy that I have mentioned several times, which creates long-term, sustainable, high-quality jobs right across the country for everybody.

In terms of taking that chance to invest in R&D—to reach 2.4% and beyond—and having the £22 billion public sector investment that has been discussed, now is the moment to do that. That is a really sound investment for the future. It is a lot of money, but it is how we are going to re-establish that stable, more productive economy that we need to fuel and to fund all the kinds of underlying public services, and so on, on which the country depends, so I think it would be a really wise investment.

I am avoiding the question, because I would rather focus on driving up that investment in R&D than work on the pessimistic assumption that it is not going to happen and therefore that we are going to have to be more conservative in our approach to R&D investment than is optimal for building that overall high-quality system that we need for the UK.

Daniel Zeichner: Splendidly diplomatic answer. I will pass you over to colleagues.

Q9 Stephen Metcalfe (South Basildon and East Thurrock) (Con): It is a pleasure to serve under your leadership, Ms McVey. Good morning to both of you, and thank you for your presentations. I truly believe that ARIA will significantly add to the research and innovation landscape, in an area where we perhaps have not done that before. That does beg the question of where those visionary ideas would have gone up until this point.

The question that I would like to ask is, what role do you believe that ARIA and UKRI have in ensuring that ARIA-funded research becomes a tangible service or product and actually supports the UK economy? If we are investing £800 million, we need to make sure that there is a benefit. I fully accept the high-risk, high-reward model—I think that is an important part of it—but we

need to make sure that we support that innovation and that research along the technology-readiness scale to make sure that it turns into something tangible that adds to our overall wealth. How do you see that role playing out?

Professor Leyser: To me, a key question in our R&D system altogether is connectivity. We have a spectacular international reputation for the quality of our R&D base right across the disciplines and in both the public and the private sectors, and we have some fantastic innovative companies creating extraordinary products and services for the UK. However, there is an acknowledged weakness in our system in the middle, so to speak, which is sometimes referred to as the valley of death. There is a lot of analysis as to what is going on there. It is partly to do with getting the right pathway of funding that supports activity across that gap.

I personally think that a bigger problem is our relatively balkanised R&D system. I think that we need to focus very hard on building much higher-quality connectivity and networking, right across the system and across that gap. We tend to think of this as a very linear, translational process, and it does not work that way. It is about joining up all the parts in a way that information, ideas, skills, know-how and, crucially, people—all those things are carried best by people—flow to and fro across that system.

One of the major priorities for UKRI is to consider the dynamic career pathways that people need to follow to connect that system up better and to support researchers in different parts of the system moving to other parts of the system—so from academia into industry and, crucially, from industry back into academia, which our current incentive structures in academia do not adequately support.

I think that that “bridging the valley of death” part is a key role for UKRI. That is exactly what we can do, because we bridge all the sectors and we have some levers on a lot of those incentives that are currently driving balkanisation. If we add ARIA into that properly connected system, then the ideas and innovation that emerge from ARIA will feed into that system in an entirely productive and creative way.

It is not ARIA’s job to think about the system and to build bridges across the valley of death; its job is to push those transformative ideas to try to drive step changes in particular areas and technologies where the experts in ARIA think the best opportunities lie. If those seeds are sown on fertile ground, they will transform into that knowledge economy that I keep talking about. My job is to make sure that the ground is fertile.

Q10 Dawn Butler (Brent Central) (Lab): Dame Ottoline, you said earlier that you expect a close working relationship with ARIA. What does that actually look like? Legislatively, what should that look like?

Professor Leyser: It is an interesting question as to the extent to which that needs to be written into legislation. In my experience, the kinds of relationship that one wants to have with key players across the system are not things for which you necessarily legislate. They are about maintaining open lines of communication and building high-quality personal relationships with different actors in the system. There are a lot of players in the R&D system. I spend a lot of my time talking to people who run other agencies—for example, in the charity sector and those who run R&D activities in businesses—

connecting them up, understanding what people's needs are, what the opportunities are and building the joined-up system I have talked of about before.

So I think the personal relationships are going to be almost as important as anything that one can write into legislation. None the less, possible tools for connection, such as seats on each other's boards, are certainly worth considering, as is observer-type status, rather than formal status, given that high-quality boards tend to be small. Our board worked really well where people were not representative but bringing their skills and expertise round the table. One does not want to bog down the governance structures for a light, agile and out-there organisation with representative requirements. As I have said before, active and engaged communication is going to be essential for ARIA, because it needs to understand the breadth of opportunity in the system to work well. It will be in everybody's interest for those activities to work well. Because of that, they will happen naturally, in the same way that I spend a lot of time talking with other funders of research and innovation already in the public and private sectors.

Dawn Butler: I agree with you that there needs to be a close working relationship. I do not think we can count on it happening naturally. I have two quick questions, if I may, Ms McVey?

The Chair: Dawn, I am mindful of time. We have seven or eight minutes. I have another three questions and Chi Onwurah to come back. Is it a quick one?

Q11 Dawn Butler: It was a quick one on why UKRI cannot access the innovators of tomorrow—the people coding at home. I did not understand what was stopping UKRI doing that?

Professor Leysler: At the moment, most of our funding opportunities require people to apply for a research grant. People coding at home have a hard time applying for research grants, because it is a system with financial checks and so on. Applying for a research grant is a non-trivial activity, whereas winning a research prize, where there is no application process and you just get on with it, is doable. We are very interested in that wider range of funding mechanisms and in how we can learn from the work of Nesta, and, in the future, the work of ARIA to reach a wider range of people. But at the moment, we work on a largely open-call process; it is really effective because it is completely open, but it none the less creates barriers for people who do not have the infrastructure and administrative support to help them submit those kinds of grant applications.

Q12 Aaron Bell (Newcastle-under-Lyme) (Con): It is a pleasure to serve under your chairmanship, Ms McVey. I thank both witnesses for their time, and Dame Ottoline for her evidence to the Science and Technology Committee, on which Ms Butler and I also serve.

Following on from Dame Ottoline's answer to Ms Butler, obviously, the purpose is to expand ARIA to cover areas that are not already well covered, but it also seems to be to try to pick up the pace of research and innovation. We have seen that that is possible through crises such as coronavirus. Can you explain how the pace can be picked up by some of the things that you do at Nesta and whether that would carry across to what ARIA is going to do?

Tris Dyson: I think it helps to pick things, to say, "We want to achieve x within the next two or three years" and to give people a degree of certainty about what outcomes you are going to fund and why. It happens naturally, anyway. Coronavirus is a crisis that has created a rush for R&D. It has also shown, on the drug development or vaccine side, what a combination of funding and relatively agile thinking, including from regulators in conjunction, can do in order to improve outcomes and achieve things. A challenge prize creates that in a positive sense; it essentially says, "We are going to solve for x and award funding on that basis." That helps speed things up.

Related to the previous question, with a grant model approach, you are funding inputs and costs primarily. People put in a proposal for half a million pounds and say, "We are going to do x and this is what the associated costs are going to be." Inherently, your risk threshold is going to be different, because you are anticipating whether this an investment that means they are going to be able to spend that money well and achieve x. You are going to look at track records, their financial history and their institutional strengths. You are going to make a judgment on whether to fund A versus B. That lends itself more towards funding the usual suspects than an outcome-based model, where you say, "It is not important to us who solves for x as long as somebody does." In reality, you tend to blend these models. It is not like there is a pure challenge prize model that does not involve other types of funding mechanisms as well.

Aaron Bell: Understood, thank you. I had better hand on, as we are running out of time.

Q13 Virginia Crosbie (Ynys Môn) (Con): It is a pleasure to serve on this Committee, particularly as a scientist. Dame Ottoline said one of the challenges was finding the right people to lead ARIA and that they were in short supply. Tris said that ARIA was about identifying visionary leaders with extraordinary ideas. My question to both of you is, how much is the success of ARIA linked to finding the right people to lead it? Are you confident that we can find them?

The Chair: If you are both answering, you have about a minute each.

Professor Leysler: I think it is crucial for the success of ARIA—it is everything. We need to go into the search process with absolute resolve to wait until we find the right people, and not appoint people just because there is a vacancy.

Tris Dyson: I agree with that. I would also say that the primary thing would be the mindset and agility, rather than necessarily focusing on a private sector background, a science background or whatever. You need people with the right creative and entrepreneurial mindset.

The Chair: Those were both short answers so, Chi, we have time for you.

Q14 Chi Onwurah: There are two contradictions that I have spotted in what you are saying. Dame Ottoline, you talked about ARIA needing to deliver transformational research and outcomes, but at the same time you said that it is too small to be entrusted with society's great challenges. Should not the public interest determine

what that transformation is? Mr Dyson, you talked about ARIA having a new diversity of funders—regional as well—yet at the same time we hear that it has got to be people who know people and have lots of experience, and we do not have diversity in the base now. Twenty seconds each on those contradictions.

Professor Leyser: I did not say that it would be too small. My point is that if it is really working on the edge of the edge, it is about capturing the extraordinary opportunities that these people see in the system. Those cannot be straightforwardly dictated. They are not to do with those outside requirements; they are to do with what the opportunities are. The smallness of the agency is to do with what proportion of your R&D spend you put into that activity, given that we have major national priorities that need substantial investment, where the target is driven by those national priorities. It is an opportunity—

The Chair: Order. I am sorry, but I am going to have to stop you there. They had both been concise answers. I am sorry that we did not finally get to hear your further answer, Tris. Thank you both very much indeed for your time, Dame Ottoline and Tris Dyson.

Examination of Witnesses

Professor James Wilsdon, Professor Mariana Mazzucato and Professor Philip Bond gave evidence.

10.25 am

Q15 The Chair: We will now hear oral evidence from Professor James Wilsdon of the University of Sheffield, Professor Marianna Mazzucato from University College London, and Professor Philip Bond from the University of Manchester. We have until 11.25 am for this session. Could the witnesses please introduce themselves for the record? I call, first, Professor James Wilsdon—*[Interruption.]* James cannot hear at the moment, so we are just going to sort the sound. Can I move on to Professor Marianna Mazzucato?

Professor Mazzucato: I am a professor at University College London, where I am the founding director of the Institute for Innovation and Public Purpose.

Professor Bond: Good morning, everybody. I have very unstable internet, so if I vanish, that is why and I apologise. I am Professor Philip Bond and I work as a professional problem solver and inventor. I am the professor of creativity and innovation at the University of Manchester, and I have visiting professorships at the University of Bristol in the computer science department, and also in engineering and mathematics. I am also visiting professor in the applied mathematics department at the University of Oxford.

Professor Wilsdon: Good morning. I am James Wilsdon, and I am professor of research policy at the University of Sheffield, and also director of a thing called the Research on Research Institute, which is based at the Wellcome Trust and does research on research systems, cultures and decision making.

The Chair: Again, I will start with Chi Onwurah, move across to the Minister, and then go side to side between the parties. After I have been to Stephen Flynn, I will ask Members to indicate whether they want to ask a question. I think we will get through everybody, as we were quite successful last time.

Q16 Chi Onwurah: I thank our witnesses for taking the time to join us today and bringing us the benefit of your considerable expertise and experience. Professor Mazzucato, you wrote the groundbreaking book “The Entrepreneurial State” and the more recent “Mission Economy”—perhaps there is a clue in the title, in terms of the emphasis on the benefits that mission-orientated research can bring. Indeed, many thought that this new agency, ARIA, was based on some of your work, yet at the same time it does not seem to reflect some of the important context that you set out for it. Can you tell us whether it will achieve the benefits that you set out in your work? What needs to change? What should the Bill Committee look at changing in order to ensure that that can happen? Similarly, Professor Wilsdon and Professor Bond, based on your work on research and innovation systems—particularly in a UK context—what benefits will ARIA bring and what needs to change in order to improve it?

Professor Mazzucato: Thank you so much for the question and for inviting me to give evidence. Without going into the history of the DARPA model—I am sure you have done that already—I think the really important thing is to ask what it is about the UK system that an ARIA could give benefit to. We need to remember that the whole point of having a DARPA or ARIA-type institution is actually to provide that kind of purpose-driven approach to innovation. It is not a replacement for blue-sky research, funded in the United States by the National Science Foundation or in the UK by the research councils. It is precisely that kind of rare moment where you can do high-risk, high-bet research, very much linked between the basic and the applied; it is neither basic nor applied.

Fundamentally, where it has been successful—let us not forget that other countries have also tried this and it has not always been successful—is when it is on the back of a strong system. For example, DARPA in the US would have failed miserably had there not also been a strong military and defence system.

Secondly, it has to work across Government. DARPA in the US, for example, works with the small business innovation research programme, a procurement programme across all the different Departments, which set aside about 3% of their budgets to do purpose-driven research that brings in, for example, small and medium-sized enterprises. Again, that procurement side means that it is fundamentally linked to how Government works; it is not separate from Government.

Thirdly, it has always been linked with a vision or mission of what is to be done. Again, in the wartime scenario, it is clear that the DARPA model was mainly about military goals, but the Advanced Research Projects Agency – Energy, or ARPA-E, is about renewable energy and a green transition, and the Advanced Research Projects Agency – Health is about strengthening the health system and going after big health innovations.

What questions are we asking in the UK that an ARPA-H and ARPA-E or an ARIA would actually resolve? If we think of one of the biggest successes of DARPA, which is of course the internet, they did not obsess about the internet. They were not saying, “Oh, we need a technology.” They needed to solve a problem. The problem at the time was getting the satellites to communicate, and the internet was a solution for that. There were also many other experiments being done at

the time, some of which failed. It is about that kind of willingness to take risks, but those being purpose-driven and problem-oriented.

The first question we should be asking in the UK is: what are the big problems? What questions are we asking that would even require an ARIA? If we do not have enough of a national debate on that, and if we do not have enough of a rethink in Government on things like procurement—the everyday of what Government does—and if we do not have strong systems underlying an ARIA, such as health and energy systems and so on, it will be really hard for this agency to be successful.

Chi Onwurah: Thank you. Professor Wilsdon?

Professor Wilsdon: I agree with everything that Mariana has just said. The one thing that many of us have been calling for since this idea was floated as an option for the UK system is more clarity on its purpose—its mission, in Mariana’s language. It is regrettable, in a way, that it has reached the stage of a Bill without that question having yet been properly answered. There are multiple dimensions to why it is regrettable.

First, it is a recipe for confusion. When it does finally decide what it is for, it has to then negotiate and haggle for space in the wider system, as Mariana said. That is time-wasting and is a source of bureaucracy, which this thing is supposed to avoid. Secondly, the Bill and the debate around it sort of vests the choices about purpose and function in the leadership of ARIA. I agree with Mariana that the role of Government in setting up a new agency is surely to undertake and co-ordinate with the public and wider society a discussion of what this would be for—what big priorities we have as UK society to which a new agency can be directed.

I am fully in favour of a new agency. I think there are lots of arguments, as we have heard already from Ottoline Leyser and Tris Dyson, that in a system that is expanding and doubling its budget over a short period of time, there is definitely scope in the budget to do new things, and I would be wholly in favour of that. Without that clarity, we essentially run the risk of setting it up and then there being a delayed period before it actually does anything very effective.

The final point I would make is that in relying on appointing the leadership as the route to answering the question, all you do is move the source of the problem. If the Government have not been able to resolve the question of what it is for, how do we identify who the right leaders are? We have not yet decided what this thing is for and where it operates in terms of the scale of basic to applied. Does it have domain focuses? I don’t see how you can find the right people. If you do find people, how do you avoid it simply becoming a tool, a plaything, of their prior interests and priorities?

In today’s line-up of witnesses, you are going to hear a number of compelling visions from different people for what this thing could do. I do not have a particular vision to sell you, but those visions map on to the prize and the things that you would expect the CBI or the Royal Academy of Engineering to argue for. If you set something up without resolving that first, you are moving it to the site of the leadership. It is a recipe for capture by particular interests in the system, which I think would be regrettable and quite distorting of the role that this thing is supposed to play, which is to be added to existing things.

I worry generally about the process, as someone who is perfectly happy to support the idea. I don’t think it is being executed in an optimal way to achieve the outcomes that the Government wish to see.

Chi Onwurah: Thank you very much. Professor Bond?

Professor Bond: I thank the previous speakers. I think that the idea is about having radical innovation, which is different from grand missions and grand challenges. Certainly the budgets that have been talked about fit an agency doing radical innovation, rather than some very large-scale grand challenges. The discussion over the need for a directed mission is an interesting one. You can do it both ways. The original ARPA started off with the rather nebulous but powerful mission statement of, “Develop strategic advantage”. That is acceptable if you have a good director who understands what that means. DARPA, for example, or IARPA and so on, have somewhat narrower remits, but that does not necessarily make things easier. A really good director can overcome issues around narrowness of mission statement by using the opportunity to do things that span across many domains. In fact, I think it is a rather liberating thing. The fact that we have not at this point had utter clarity on things I regard as extraordinarily good, not bad.

A defining characteristic of all of the US ARPAs is that they have a strong focus on rotating people in and out—about 80% from industry and 20% from academia, or some balance like that—and they do a lot of work with both. I entirely agree with what was said about a link between applied and more fundamental research, but I want to strengthen that statement by saying that with the industry base there is a focus on getting things done as opposed to publishing papers, and it is important to remember that.

On risk tolerance, a lot has been said about DARPA and taking a lot of risk. I personally think that talking about taking a lot of risk is a poor framing of what they do. What they aim to do is have a significant multiplicative effect on what they achieve. In other words, radical innovation simply says, “We want step change. We want to do things that would create a tremendous impact were they to be done.” What DARPA—all the ARPAs probably, but let’s talk about DARPA in America—has always been good at is managing that risk tremendously well. A large part of the reason they have succeeded is their extraordinarily good management of risk.

In terms of deciding what it is for and whether one should necessarily have a public engagement with that, for some things that is very valuable. For others, opacity is surprisingly effective. Most of the US agencies have some degree of opacity, partly because they work on defence and security, but partly because you are going to ask people to stick their neck out and try to do things that they start out by viewing as probably impossible. Step 1 for an ARPA mission specialist or programme manager is to try to get some evidence that it is not impossible and might be possible. If you are asking people to work like that, shining a spotlight on them is more or less placing them under pressure to step back from that plate and become more conservative. I do not think that is a good thing.

Q17 Chi Onwurah: Thank you very much. Professor Mazzucato, you were very clear that it is helpful not to consider this as a replacement institution. We have

already heard some confusion as to whether it is cutting edge or transactional. You were also clear about the need for a strong research base, engagement on procurement, and a vision. What should that vision or mission be, in your view? We have heard from Professor Bond that there might be a trade-off between transparency and risk taking. How would you respond to that?

Professor Mazzucato: I just want to clarify what I understand in terms of challenge orientation, because I think there is also a bit of confusion there. Challenges globally are the sustainable development goals. Every country is actually signed up to them, including the UK, so we should hear a bit more about the SDGs in the UK national debate.

Let us just bring it back to the DARPA or NASA kind of model. Broadly defined, DARPA is, of course, challenge-oriented. The key thing is how it can translate those challenges into missions. Take the moon landing, which I wrote about in my recent book. I talked about both what to copy and what not to copy from it—most of it was what not to copy. The challenge was the space race, the cold war, Sputnik—NASA did not have much to do without that. They transformed that into a mission, which was to get to the moon and back again in one generation, so it would be wrong to say that DARPA and NASA are not challenge-oriented.

The point is that how they are structured is much more specific than that. Those are problems that need solving. They did not just say, “Oh, let’s go and compete in space with the Russians.” Again, it was very specific: getting to the moon and back in one generation. You can actually answer the question, “Did you get there: yes or no?” Lots of different sectors got involved; it was not just one big isolated project—that is the whole picking winners problem. It required innovation in nutrition, textiles, materials, electronics, and the whole software industry can, in some ways, be seen as an output of that. Again, how did they organise the thinking and the purposefulness of the organisation? One of the first things they did was change their own internal structure to be much more horizontal, with project managers, precisely to be purpose-oriented.

I just think there is a bit of a false dichotomy between whether you need a challenge or whether it is about a big radical innovation. DARPA has always been challenge-oriented, and that is why they needed those radical innovations to actually confront those challenges. The questions they were asking were much more specific and were framed in a targeted way, so you could actually answer the question, “Did we achieve it or not?”

In terms of the risk, I absolutely agree that it is not about risk for the sake of risk. In a conference I organised back in 2014, called “Mission Oriented Innovation”, I invited Cheryl Martin, who back then was the second director of ARPA-E, and she said that they actually structured ARPA-E in such a way as to welcome as much high-risk thinking, and that the whole point was to matter in the economy. They would actually measure their success both on whether they took those risks, because if they were going for easy things, they were not doing their job, and on whether their successes, of which there would only be a few—they accepted that there would be lots of failures—would have a big impact in the economy. For example, they ended up being very important for battery storage.

ARPA-E is very different from DARPA. It has a tiny budget of about only \$300 million a year. One of its problems—it is also really important for the UK to learn about the problems—is that it has been too wedded to industry. It has focused too much on asking industry what it needs and then it ends up almost being this massive technology office, compared with DARPA, which had a very clear Government customer—basically, the Department of Defence. It is important to ask again who the obvious customer for ARIA is and how that is linked to different Departments, so it does not just become a matter of bringing geeks into government—the line Dominic Cummings mentioned. Yes, you want experts in government, but geeks in and of themselves are not what you want to strive for; you want to solve problems that different Departments of a democratically elected Government put out there.

We should also make sure that those problems are not told to Government by experts like ourselves on this Zoom call, or other Zoom calls, as James rightly said, when everyone will just put forward their own pet project. We need to think about the democratic forums and the different types of the debate that are needed in a country, precisely so that the problems and purpose are shared as widely as possible. That includes winning the war, back in the cold war days.

Q18 Chi Onwurah: What do you think ARIA’s mission should be? I will put that same question to the other witnesses.

Professor Mazzucato: I am holding the 2017 industrial strategy, which Greg Clark’s team put together. We were very much advised on that and one of my roles was to say stop just making lists of sectors. You will remember that under David Cameron’s team there were five sectors: automotive, aerospace, life sciences, finance/financial services and the creative sector. I said not to make a list of random sectors, which can easily get captured by those sectors with the loudest voice, but to think about what their problems were. They solved that in the industrial strategy—they listened, and I was very happy—and decided on four challenges, namely, healthy ageing, clean growth, the future of mobility and the opportunities that AI and the data economy provide to us.

In terms of identifying the missions underneath those, I set up a commission co-chaired with Lord David Willetts entitled the Commission for Mission Oriented Innovation and Industrial Strategy. We worked very closely with the different challenge teams in BEIS precisely to answer your question. It is definitely not the role of an economist, academic or business person to tell you what the missions are. That must be co-created within Departments alongside different stakeholders, but surely the first answer is that those missions must be those that respond to those four challenges.

On clean growth, the answer must be carbon-neutral cities all over the UK; or take a global challenge such as clean oceans—sustainable development goal 13—and getting the plastic out of the ocean. What is the UK’s contribution to that? What about the digital divide, under the challenge of AI and the data economy? Just think back to when the BBC had a mission. Back in the 1980s, it wanted to get every kid to code, before it was sexy—today it is very sexy to talk about coding. The BBC was doing that back then, and its own procurement strategy helped to deliver that by producing the BBC

Micro computer. The BBC did that not because it was obsessed by technology but because it needed it to fulfil that mission. So, this strategy is not completely new to the UK, but we should not pursue it as a siloed project; it must answer the big questions such as the digital divide, carbon neutrality, health ageing and so on. But you have the 2017 industrial strategy, so start there; we cannot keep rethinking from scratch each time.

Q19 Chi Onwurah: Thank you. Professor Wilsdon?

Professor Wilsdon: I do not have a mission in my back pocket that I want to push. My argument is simply that the thing needs to have more clarity. I do not really mind what it ends up doing, as long as we go into it with a better sense of what we are trying to get out of it, as Mariana said. It is worth going back to some of the other strategic documents that operate and run the UK system, including the industrial strategy, as Mariana says.

In July last year, the UK Government published its draft R&D roadmap. Again, that is a good idea and it is something that many other countries do. It set out a longer-term planned direction for the system, and tried to explain to the system and to wider stakeholders how the different parts fit together and their different functions. To me, the logical sequence of events would have been to conclude that process—I realise it has been a difficult year for everyone for obvious reasons—and then to identify the particular gaps and priorities to which a new funding mechanism could be directed. What we have done is fixate on a particular institutional model, imported from the US in the late '60s, and dumped into Britain today, as the way in which somehow, magically, we are going to cut through all sorts of real or perceived barriers and obstacles in our existing research and innovation system. I just think that is a very flawed way to do this.

We are where we are. The Bill is in front of Parliament. We need to focus at this point on how we can amend it, or you can amend it, to improve it. I think that trying to bring more clarity, or at least a sense of how this issue will be addressed through the governance of this new thing, is really important. Otherwise, you or your successors, and we or our successors, will be back here in a few years' time, asking ourselves why it did not work. I know that it has a tolerance of failure—we are all in favour of that—but the thing has to at least succeed in some respects, alongside its appetite for failure.

Chi Onwurah: Thank you.

The Chair: Professor Bond, did you want to comment?

Professor Bond: I just want to make a remark, if I may, on scale. Talking in the same breath of putting man on the moon, which cost up to 5% of US GDP, so roughly 60% of UK GDP, and ARIA, for which the figure is £200 million a year, is, I think, an issue.

I agree that there is confusion about challenge. The grand challenges are really better structured in different ways, which is why NASA has a director and why the Manhattan project had very strong, firm leadership. I want to use that to emphasise, first, that ARPA/DARPA mainly does not use challenges. There are some fields where it has done—robotics, autonomous vehicles and a few others—but that is not its main way of doing things. The issue about the word “challenge” is that for some things, particularly in computer science, it can be

a very good way to bring together people in different teams that would not normally operate in that way, but it is just a mechanism for doing that.

The question you have asked me is about the mission for ARIA. I totally agree, by the way, with what was said: it is much easier in life if you have a customer. But if a really good director is picked, they are going to go out and get some customers—probably within Government. There is so much that can be done in government; there are so many good things to be done that if you have an imaginative and intelligent director—I am sure that will happen—that person can find plenty of sensible things to do. I therefore think you do not need to be overly prescriptive; you can try to leave it open.

I was also involved in the structuring around the industrial strategy grand challenges. First, they are another step up in scale. Secondly, I do not think we should be binding anyone to having to focus on those at all. It is rather obvious that there are many interesting and important problems societally. It is obvious that there are many, many ways in which somebody could look to do things, whether with education and helping kids to learn better, or with the NHS or anything else. I would leave it up to the director and the mission folk to do. The whole point of a DARPA is really to leave it open.

What you want these people to do is one thing: you want to demand of them that they make their best attempt to do radical innovation—to do things that, were they to work, would mean a step change in what should be done. It is going to be easier if that can get implemented in some efficient and effective way, so how that is done is a great question, especially as it will be a small office. That is somewhere that the office is clearly going to have to work with Government and find customers within Government, and do things that are so impressive that that will work. That is a challenge, but that is why you get a director.

Chi Onwurah: Thank you.

The Chair: Minister?

Q20 Amanda Solloway: Thank you, Ms McVey, and thank you to all the witnesses. I have just one question for Professor Philip Bond. We have tried to balance giving ARIA independence and ensuring good governance. What are your thoughts on the ideal size of ARIA's board and giving ARIA's chair the freedom to decide who sits on it?

Professor Bond: I would probably have a board and another structure. Certainly one of the super-important things that works in the US ARPA is that the programme managers are challenged in a sort of dragons' den. It is a friendly dragons' den, but they have to convince very capable, technical people that they can do what they do. That is one structure that would need to be slotted into place.

As for the board, I think you could have a slightly unusual board. I do not think it needs to be big; it could be very small. It could be less than 10 people, for sure, but you could also expand it a little bit with something that is a bit like a non-executive director, or NED—somebody from a different area with a rather different take on things. The balance will be important. You want a balance of people; I think you want some very

radical thinkers in there, some people who know how things work in industry and some people who know how things work in academia, and so on.

As for the autonomy, I am personally a big believer in giving the chair and the director enormous amounts of autonomy. You pick people you are willing to bet on and then hand them a lot of trust. In fact, if you want to define the ARPA model at some level, it is this: it is a different model of trust. Bureaucracies occur because although we like to trust people, we have to throw up lots of rules and regulations to make sure that things work the way we feel they should work. What you are doing in creating this kind of model is handing trust to people. You want people with high integrity who are brilliant, and then you let them get on with it, and you trust that they will do something that reflects their character.

I do not think the board needs to be big; I think it needs to be very good. There should be a small number of outstandingly good people, who can tap into a broader network and bring in people to give a different vision and view from that which you will only ever get with a small number of people.

The Chair: Before I go to Stephen Flynn, can I just have an indication of who wants to ask questions? I have got Sarah, Daniel, Aaron, Jane—okay. Thanks very much indeed.

Professor Mazzucato: Can I make one super-quick point on what Philip just mentioned?

The Chair: Absolutely, and then I will go to Stephen.

Professor Mazzucato: One of the things that DARPA is very good at is not only turning the tap on, in terms of funding the things that we have been talking about, but knowing when to turn it off. Knowing how to pivot and to be flexible and agile is absolutely necessary. Not only should this agency be free from burdensome bureaucracy, it needs to proactively get an agile and flexible structure, and the metrics that tell you when to turn the tap off, because this is the challenge. You want to be long-termist—going for the difficult things and not the easy ones, which you do not need an ARIA for—and also to have the metrics internally to tell you when things are not going right and when you actually have to stop.

Q21 Stephen Flynn: Thank you to the three of you for your information so far; it has been incredibly helpful.

I have a question for James and Mariana, and then one for Mr Bond. James and Mariana, you both clearly want to see a mission. However, I do not think we should necessarily kid ourselves that the Government will be minded to agree to any amendment in line with that. Do you have any other wider concerns about the Bill whatsoever, or around ARIA as an entity? Do you see any positives at all? In a previous evidence session, we heard about the good prospect of it being small and agile. Is that something that you would see as a positive?

Mr Bond, you are placing a lot of emphasis on the director—I think you used the words “people with high integrity who are brilliant”. That is pretty vague, to say the least. I am sure we could all pick people who we think are brilliant and have high integrity, so are there any definitive qualities, or anything at all with a little

more substance, that individuals should have, perhaps in relation to scientific merit, or their background and commercial activities?

Professor Wilsdon: You are specifically thinking about aspects of the Bill that can be tightened and improved, accepting that there is only so much that can be done at this stage. The National Academy of Sciences—the Royal Academy—has published a very good and detailed set of probing amendments to the Bill just this week, and I would certainly endorse several of them. They include inserting a clause that requires ARIA to complement the work of UKRI. That would go at least some way to dealing with the concern that persists over boundary skirmishes, shall we say, or fuzziness at the edges of what the big public funding agency is there to do and what this new thing is there to do.

Accepting that it is going to be hard in the middle of the Bill to define the mission—it is the wrong way to go about it—I wonder whether tightening up some explanation in the legislation of how the process of defining the function and orientation will work, whether on a cyclical basis, for example, choosing particular things to focus on over a five-year cycle or whatever, would also help.

I worry greatly about the touching faith that Philip and others seem to place in the capacity of the chief executive and chair to be these sort of omniscient, wise characters and, indeed, in the Government to choose the right people. It is very important when we are spending £800 million of public money that we establish proper mechanisms of transparency and accountability. I do not think that has to inhibit innovation. I do not think there is any supporting evidence that freedom of information or other measures that currently exist are inhibitive of effective innovation. I do not recall any discussion of that coming up during the passage of the Higher Education and Research Act 2017, three or four years ago, which Committee members may have been part of, and when UKRI was being created. It was not a problem to which any discussion was directed, so I am confused. Such provisions apply to DARPA and other bodies in the US system.

When it comes to people, I hope very much that the Government manage to secure talented people. I hear Lex Greensill is available and has impressed many senior figures in Government in the past with his innovative and disruptive approach to various financial mechanisms. That is the point: if we want this thing to survive and persist and be a valuable addition, it needs to be set up in a way that will avoid capture by anyone—by me, by Mariana, by Philip, by anyone. That is the reason why we have the structures. It really is incumbent on Parliament now, through this process, to try to put more of those mechanisms in place. I just do not see the evidence that they will inhibit its effectiveness.

The biggest barrier to effective, creative, high-risk funding of research and development in this country over the past 10 years has been lack of investment, period. That is the issue: lack of investment. It is great—it is wonderful—that the Government are tackling that with its doubling of public R&D by 2025, if they get there. As I said at the start, that creates the space in which new initiatives such as ARIA can thrive—I hope they do—but there is no evidence that I am aware of for some of these unsupported assertions that are being bandied around about bureaucracy in the system and

transparency being the problem. I just do not see it. In terms of the legislation, it is very important to try to tighten those provisions.

Professor Mazzucato: I would agree with a lot of what James said on investment. It is very important to remember that the UK continues to have a below-average GERD—gross R&D spending—over GDP, but also a below-average BERD—business investment in R&D. One of the key things that the DARPA model did in the past was precisely through being ambitious in areas that were market creating, not just market fixing, and also really cheap to crowd in business investment. Again, as I mentioned before, we need metrics to make sure that is happening—in other words, that it is actually creating additionality and getting investment to happen that would not have happened otherwise.

Coming back to the big question, which is a very important one, there are three big things we need to make sure we are doing. One is to have a very clear idea of the innovation landscape in the UK and exactly the gap that this new agency would be filling, because even though it might be exciting to form a new agency, if it is not filling a real gap and is just creating a bit of confusion and repetition, or creating something we do not need, that is a huge problem. Personally, I think it is a good idea, especially if we structure it in the right way.

One of the things I did in the European Commission was put forward this idea of mission-oriented innovation. On the back of that, missions are now a new legal instrument within the European Horizon programme. What that does is ensure that the part of the European budget that used to be challenge-oriented in a very vague way now has the concept of missions to guide it. I argued that we needed to make sure we know what we are talking about when we use the word. I argued that five different conditions had to be there.

The first was that missions be bold and inspirational with wide societal relevance. The second was clear direction—targeted, measurable and time-bound. That is the point before: making sure you can answer “Did you achieve it or not?” The third was to be ambitious but realistic, supporting existing research and innovation actions as well as applying them to those difficult new areas, and, again, areas where there is actually a customer basis. The fourth was that they have to be cross-disciplinary, cross-sector and cross-actor. I gave an example where it is not just about going to the moon—a carbon-neutral city would also require all sorts of innovation across multiple sectors. So it is making sure this does not replace a sectoral approach, but really fosters that inter-sectoral approach. The fifth was that it has to stimulate multiple bottom-up solutions. That is where we need to make sure we are not confusing the concept of missions with projects—often pet projects.

Third is the whole point about expertise in Government. Of course we need expertise in Government and we often have that expertise. When we do not have that is also when you are most open to capture. In my recent book “Mission Economy” I dug out some really interesting documents in NASA, during the Apollo programme, where they said “If we stop investing within our own brain, our own R&D, we are going to get captured”—by what they called “brochuremanship”. At the time, businesses did not have sexy PowerPoints, like, say, PwC, Deloitte and so on: companies came in with brochures to argue why they should be working with NASA. They said,

“We need to be working with the best businesses out there, and in order to know how even to write the terms of reference with the businesses and know which ones to work with, we ourselves have to be knowledgeable.”

This comes back to the point, do we have a Government who have been, over the last decades, investing within their own dynamic capabilities within the public sector? I think, here, we need to look at what has been recently coming out in the news. Lord Agnew argued that we have been infantilising Whitehall by the over-use of consulting companies. So the lack of investment within Whitehall, within Government, in their own capabilities, is the biggest opener to the possibility of getting captured; because they do not necessarily then know what they are doing in different landscapes.

Lastly, I would argue that one of the things that most distinguishes the UK innovation landscape from the US one, even taking size into consideration, and everything else, is the lack of confidence. Since I have lived in the UK, for the last 20 years—I am now proudly a UK citizen—there has been constant change in names, whether it is the Technology Strategy Board becoming Innovate UK or what is now the Department for Business, Energy and Industrial Strategy having changed its name four times in the past 20 years. If Government do not know what innovation is for, and if they have these constant consultations with others telling them what to do, that exudes—it kind of reeks of—lack of security. I am not saying you should be confident for the sake of it. I do not even think that is necessarily a value to be held; but this idea that actually we do not even know what we are talking about in terms of what the role of BEIS is, or what the different types of institutions are, what their role is and how they can work together with a dynamic, innovative division of labour, instead of constantly changing the names of existing institutions or bringing forth new ones: that is just something that someone is going to have to deal with.

The Chair: Professor Bond?

Professor Bond: I think the question I was asked was about the qualities I might look for in someone. I think that the principal quality that you want in a director, and in the programme managers, is divergent thinking. We have a tremendous system for educating people to become extraordinarily good convergent thinkers. That means they are very good at solving problems in a specialised domain; and that is a valuable set of skills. Here, you need something that goes beyond it. We have heard a lot about NASA. NASA famously realised this in the early days and set about looking for divergent thinkers—and had a test for divergent thinkers. You want someone who shows the ability to be both a very good convergent thinker—a conventional thinker—but also a very good divergent thinker. That is a much rarer thing.

I think you want someone who has shown that they have a real interest in cross-cutting by having done it much of their life. A lot of people talk about it but do not do it. So you want someone who does. When I say cross-cutting I mean across different disciplines—someone who has actually done more than one discipline and someone who has actually worked with industry and academia. That is what I think would be ideal—someone who has an insight into science but also engineering, because you are going to need engineering know-how,

and engineering thinking is not the same as scientific thinking. I have worked a lot with Formula 1, for example, and with Rolls-Royce, and it is a different form of thinking.

It is a little closer to what Professor Mazzucato was referring to when she said that you want to combine the thinking of fundamental research with really pushing the limits and boundaries of things. I think you want someone like that. Someone phrased it to me recently as not wanting to see the usual suspects; that is probably one way you can frame it. I think you want somebody who is clearly respected, because people who know them know that at least they have solved some hard problems.

I would like to address the point about avoiding capture. You can talk about people having special interests. Lots of people have come out and said what they think this should do. I have tried rather hard to say exactly what I do not think it should do. I do not think it should do this, that or the other and I do not think that you should necessarily say that it should do this, that or the other, so I am not someone who would want to end up capturing it, in that sense. I want to firmly assert that you put trust in people. When you put trust in people, those people will have some ideas, expertise and background, so you will be making choices. Making choices does not equate to capture, and it is entirely possible to put trust into excellent people and let them do things. We do that with democracy and with Parliament.

In terms of the level of transparency, transparency is a good and wonderful thing in most areas, but if you are asking people to go out on a limb to really push the envelope, I would assert that there is an argument, which has some validity, that you make it psychologically much easier for them if they do not feel that they are under a microscope. Many people tend to step back when they are there. Unless there is some overarching reason for it, I think that they can absolutely be over the size of what is done—they should be and will be—but I do not think it needs to be excessively burdensome in terms of the transparency of what is happening. Again, it comes back to the trust model that you have. The trust model I have is that I believe you can find people you can put trust into, even with £800 million.

The Chair: Thank you very much. I am just going to give the timing because I do not want to run out of time and we have less than 15 minutes left. I have the list of people wanting to speak and I will take it in this order: Daniel Zeichner, Jane Hunt, Sarah Owen and Aaron Bell. Did I miss anybody out? No. I move now to Daniel Zeichner.

Q22 Daniel Zeichner: Thank you very much, Ms McVey. I have two questions; the first is to Professor Mazzucato. You obviously set a lot of store by the 2017 industrial strategy—you waved!—yet its current status seems somewhat uncertain. Were that not to be going forward, does this whole system then work, in your view? What would be the impact of not having those great challenges and goals set out?

Then I have a question for Professor Bond, which was actually posed by Professor Wilsdon in an article he wrote a while ago. He asked:

“What empirical evidence is there of the problems in the UK’s R&D system to which the Aria bill is the solution?”

Professor Mazzucato: Talking about innovation policy without an industrial strategy or an industrial strategy without an innovation policy are equally futile. The problem is what do we even mean by an industrial strategy. I have already mentioned that I think that the wrong kind of industrial strategy is one that makes a random list of sectors, technologies or types of firms, to find SMEs and so on. It is more one that focuses on problems and then gets all sorts of different sectors to solve those problems together and then, for example with SMEs, it gives them extra support because they are small. The support they get is not because they are small, as though small is great quality, but because they become an active member of a transformation strategy in which both the industrial and the innovation side are equally important.

It has been talked about that the UK Government are abandoning their industrial strategy; I do not think that is actually true. I speak to very able civil servants working today in BEIS and I think action on an industrial strategy is going forward. My question is, why have we decided that it is no longer called an industrial strategy? That actually comes back to my previous point about the lack of confidence—perhaps someone decided that it sounds too ideological, although I am not sure why because it is not at all. The US Government are reviving their industrial strategy. Many countries have industrial strategies. The reason that Denmark is the No. 1 provider of high tech green digital services to China, which is spending more than \$2 trillion greening its whole economy, is because it has had an industrial strategy.

One thing is to name things for what they are. The UK continues to have an industrial strategy. Wonderful documents have come out about the innovation policy from BEIS, but if we are not calling things what they are, that creates confusion. The way to attract top people to Government is to be clear, as I said before, about what Government are for.

Let us look at the way that the US Government managed to hire a Nobel prize-winning physicist to direct the Department of Energy, Steve Chu. He set up ARPA-E back in 2009, where the first director was Arun Majumdar, who then went on to direct the energy programme for Google. He was not told to come in because he was a geek, or to incentivise business for the sake of it; he was told to come in to help Obama direct the stimulus programme, which was \$800 billion, in a green direction. That sounded incredibly exciting and, of course, he was willing to leave Stanford for some years to do that.

The best way to bring top thinkers and experts with different types of expertise into Government is to make it exciting in terms of what Government are there to do. That has to be not just fixing market failures but being actively part of the co-creation and co-shaping, alongside business, of the markets of the future. DARPA has been really good at doing that within its space. It does not matter what the budget is—I would argue for a larger budget for innovation in general in the UK, but even with a fraction of that budget, what is the remit of that organisation? If it is just fixing problems along the way, or asking business what it needs, or being a clear, proactive, mission-oriented shaper of markets, that will definitely impact its success, but especially who will want to work in it with high expertise.

Professor Bond: I was asked, what evidence is there of issues in UK R&D to which ARIA is a solution? First, we have a wonderful science base but it has largely become incentivised to publish papers in fancy journals—that is how you make your mark and get promoted and respected. That is a fabulously good thing, but ARIA can do something quite different. When you work in industry, your goal is to build or make something or move something forward, not worry about publishing it. In fact, usually you do not bother to publish it. For all that we are a tremendous scientific nation, there has been such a focus on that, but we could focus a lot more on doing things rather than feeling that there should be publications. I am not saying that there should not be publications, but that certainly should not be the focus.

A lot of what happens in academia, for perfectly good reasons, is to move things to some low-level prototype at most. There is often a lack of the kind of engineering that companies are required to do. That is not to wave a finger at academia—that is not what it is there to do. You need to do things differently when you are in industry. There is a role to be played by a group that can do those two things very well. Industry also does not necessarily do everything as well as one would like. There are exemplars where everything gets done very well, I hasten to add. It is absolutely possible, as Professor Mazzucato put very well, to link applied research to develop things and to bring in deep expertise when you need it. We can do more of that, and I think this can be an exemplar of a good way of doing it. If you want evidence, it is that the Americans have done that with ARPA and have been really successful at it. We have not had one. I will use that as the evidence.

The Chair: Thank you. Mindful of time, I call Jane Hunt.

Q23 Jane Hunt (Loughborough) (Con): Thank you, Ms McVey. It is a pleasure to serve under your chairmanship. My question is to Professor Mazzucato and Professor Bond. In the previous session, it was very interesting what UKRI said about there being almost a language of going through the process of bidding for and gaining R&D funding in the UK, and they do it very well. But they talked about there being an area that could be developed to free up minds. How do we attract fresh ideas and thinking from some of the experts and inventors of our generation who are not always able to engage in the current R&D structure?

Professor Mazzucato: Wow, that is a fantastic question, and of course it also goes back to the education system. This may be too broad a point, but the more unequal an education system is, the less able a country is to access the full range of potential innovators, so we should always be linking up the two. Education should really be the great leveller. There is this big distinction between private and public, and even within the public and state system there are huge differences. One could even look at the whole A-level system. I once asked myself how many people in the UK study mathematics. Only a few do an A-level in maths. Do you even study calculus? In most countries, everyone, whether they become a poet, an engineer, a geologist or an English teacher, studies calculus as part of their training. Going back to the education system and looking at how it is distributed, in terms of the high quality within a country, but also regionally and by class, is a big point.

On the other part of that question, the first point that I made today is that the discussion about ARIA should not get confused with the fact that we always need curiosity-driven research. The National Science Foundation funding or the Research Councils UK funding in the UK really should reward great ideas because they are great ideas, whether or not they are talking about some big societal challenge. That should always be properly funded. Again, if you compare us with some other OECD countries, we are not necessarily on par with that.

We should have a conversation at the same time about what institutions galvanise the mix of thinking between basic and applied. That is why Vince Cable set up the catapult centres, which were modelled on the Fraunhofer institutes. The difference between Fraunhofers and catapults is not only that the German Government spend 10 times as much on Fraunhofers as we spend on catapults, but also that the same person—the same individual human being—goes from being a civil servant to being a businessperson within the Fraunhofers. There is a much less fuzzy distinction that we tend to make in the UK between the bureaucrat and the entrepreneur. That itself is a really interesting function of an agency, coming back to Professor Bond's point that we should not have these siloed areas, with academies just doing the academies and then businesses on the other side. Finding those interesting corridors, where there is a basic needs supply but the same person breaks down the false dichotomy between bureaucrat and entrepreneur, is something that is perhaps missing in the UK's innovation landscape.

The Chair: Thank you. Can I just interrupt and say that there are three minutes left and I have two questions left? Can people be to the point?

Professor Bond: I think ARIA cannot and will not address every creative mind that we have in invention, but we can do more as a nation for inventors. We can do something like Kaggle, which is a fabulous way of bringing people together. We can do more easy seeding of things, and we can have a lot more Makerspaces. Those are a couple of ideas. I could keep going on, but we do not have time.

The Chair: Thank you.

Q24 Sarah Owen (Luton North) (Lab): It is a pleasure to serve under your chairmanship, Ms McVey, especially in my first Bill Committee.

We have heard a lot of evidence in the two sessions about the need for ARIA to identify what it is for. We should also be clear about what it is not for. Professor Wilsdon, do you think that moral and ethical boundaries need to be placed on ARIA?

Professor Wilsdon: You mean in terms of the research areas it would work in?

Sarah Owen: Yes.

Professor Wilsdon: I am not sure whether one would need to legislate for that. I would expect that most provisions in those areas would apply, but it is a good question and one that bears more thought. It links a bit to my point about accountability mechanisms. As I have said already, the nervousness is that you combine an institution with a fuzzy, ill-defined purpose with very loose mechanisms of accountability. That is a recipe for

all sorts of problems down the line, as well as potentially for great things—who knows? It is a model that has very obvious potential flaws. It is not going to work in the defence arena, which is clearly the one, as I understand it at least, that would raise the most issues in that respect. The key thing is the governance structure for this entity, which I see as too loose.

The Chair: I think we are going to hear your question, Aaron, but we will not get the reply.

Q25 Aaron Bell: Professor Bond, you said that opacity is useful because it avoids too much pressure being put on people. Does that apply to trying to get new people into the space?

Professor Bond: Sorry, when you say “new people”—

Q26 Aaron Bell: People we are trying to get in through the challenges and so on.

Professor Bond: Yes, I think so.

The Chair: Perfect. We have come to the end of the time allocated for the Committee to ask questions, and indeed for this morning’s sitting. I thank our witnesses on behalf of the Committee for their evidence. Professor James Wilsdon from the University of Sheffield, Professor Mariana Mazzucato from University College London and Professor Philip Bond from the University of Manchester, thank you very much indeed.

Ordered, That further consideration be now adjourned.
—(Michael Tomlinson.)

11.25 am

Adjourned till this day at Two o’clock.

PARLIAMENTARY DEBATES

HOUSE OF COMMONS
OFFICIAL REPORT
GENERAL COMMITTEES

Public Bill Committee

ADVANCED RESEARCH AND INVENTION AGENCY BILL

Second Sitting

Wednesday 14 April 2021

(Afternoon)

CONTENTS

Examination of witnesses.

Adjourned till Tuesday 20 April at twenty-five minutes past Nine o'clock.

No proofs can be supplied. Corrections that Members suggest for the final version of the report should be clearly marked in a copy of the report—not telephoned—and must be received in the Editor’s Room, House of Commons,

not later than

Sunday 18 April 2021

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The Committee consisted of the following Members:

Chairs: †JUDITH CUMMINS, MR PHILIP HOLLOBONE, ESTHER McVEY, DEREK TWIGG

† Baker, Duncan (<i>North Norfolk</i>) (Con)	† Onwurah, Chi (<i>Newcastle upon Tyne Central</i>) (Lab)
† Bell, Aaron (<i>Newcastle-under-Lyme</i>) (Con)	† Owen, Sarah (<i>Luton North</i>) (Lab)
Blackman, Kirsty (<i>Aberdeen North</i>) (SNP)	Richardson, Angela (<i>Guildford</i>) (Con)
† Butler, Dawn (<i>Brent Central</i>) (Lab)	† Solloway, Amanda (<i>Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy</i>)
† Crosbie, Virginia (<i>Ynys Môn</i>) (Con)	† Tomlinson, Michael (<i>Lord Commissioner of Her Majesty's Treasury</i>)
† Fletcher, Mark (<i>Bolsover</i>) (Con)	† Zeichner, Daniel (<i>Cambridge</i>) (Lab)
† Flynn, Stephen (<i>Aberdeen South</i>) (SNP)	
† Furniss, Gill (<i>Sheffield, Brightside and Hillsborough</i>) (Lab)	Sarah Ioannou, Seb Newman, <i>Committee Clerks</i>
† Hunt, Jane (<i>Loughborough</i>) (Con)	
† Mayhew, Jerome (<i>Broadland</i>) (Con)	
† Metcalfe, Stephen (<i>South Basildon and East Thurrock</i>) (Con)	† attended the Committee

Witnesses

Dr Peter Highnam, Deputy Director, Defense Advanced Research Projects Agency

Professor Pierre Azoulay, MIT

Dr Regina E. Dugan, CEO, Wellcome Leap

Professor Dame Anne Glover, Former President, Royal Society of Edinburgh, and Special Adviser to VC, University of Strathclyde

Tabitha Goldstaub, Co-Founder, CognitionX (also Chair, AI Council)

Adrian Smith, President, The Royal Society

Felicity Burch, Director of Innovation and Digital, Confederation of British Industry

Professor Sir Jim McDonald, President, Royal Academy of Engineering

David Cleevely CBE, Chair of Focal Point Positioning Ltd and the Cambridge Science Centre

Bob Sorrell, Chair, CaSE

Public Bill Committee

Wednesday 14 April 2021

(Afternoon)

[JUDITH CUMMINS *in the Chair*]

Advanced Research and Invention Agency Bill

2 pm

The Committee deliberated in private.

Examination of Witnesses

Dr Peter Highnam, Professor Pierre Azoulay and Dr Regina E. Dugan gave evidence.

2.1 pm

Q27 The Chair: We will hear oral evidence from Dr Peter Highnam, deputy director at the US Defense Advanced Research Projects Agency; Professor Pierre Azoulay, Massachusetts Institute of Technology; and Dr Regina Dugan, chief executive officer of Wellcome Leap. We have until 3 pm for this session. I call on the witnesses please to introduce themselves for the record.

Dr Highnam: Thank you very much for the invitation. I look forward to your questions.

Professor Azoulay: Good afternoon. Thank you very much for inviting me to testify in front of the Committee. I look forward to the exchange.

Dr Dugan: I am Regina Dugan, the CEO of Wellcome Leap. I look forward to your questions.

The Chair: Thank you for coming to this important evidence session. You are all very welcome. We will start the questions with our shadow Minister, Chi Onwurah.

Q28 Chi Onwurah (Newcastle upon Tyne Central) (Lab): It is a pleasure to serve under your chairship, Mrs Cummins. May I also echo your thanks to our witnesses for taking the time to join us for this important session? I am in awe of the range and breadth of your experience in innovation and scientific research, and all the more grateful to those of you with experience of DARPA for joining us this afternoon, as the architect of the Advanced Research and Invention Agency, Dominic Cummings, the previous adviser to the Prime Minister, has apparently refused to give evidence to the Committee. We are able to go only by what he has said previously, and there seems to be some confusion as to what ARIA is and whether it should be engaged in cutting-edge research or in the translation of existing research. You might be able to comment on that.

Dominic Cummings said:

“The purpose of ARIA ought to be to sample in this broader design space, to do things differently, and to learn from the things that have been super-productive in the past. That means in very simple terms extreme freedom.”

Dr Highnam, does DARPA have “extreme freedom”? What does that mean in cultural terms? Does complying with, for example, US freedom of information laws or procurement regulations—it is proposed that ARIA would be exempt from them—impact on that freedom?

Dr Highnam: That is a great question. DARPA is an agency in the Department of Defense in the US Government. We have a number of regulations and laws that of course we operate within. We have a number of special authorities that allow us to operate a little faster and with a little more independence, but with oversight. It is a place that moves quickly. As you are probably aware, when you show up at DARPA, you have an expiration date on your badge, as we say, so you move fast and the whole place is geared to do that. The agency now has a record of 63 years of production—again, with oversight at all times. It gets the job done, in that context.

Q29 Chi Onwurah: I will follow up on that and then bring in the other witnesses. You speak about oversight. Would it be possible to give a bit more detail on that? In particular, the UK Government are currently mired in a cronyism scandal; indeed, that is what is being debated in the House today. DARPA is well known for having exchange between itself and the private sector, but how do you prevent projects or programmes from going to friends, mates and those with, if you like, special interests, without some degree of oversight?

Dr Highnam: I can speak only to how DARPA operates. We have very rigorous review processes—technical, financial and others. We have conflict of interest rules and so on that we all follow. There are robust processes and independent looks at those processes. Again, we could not operate any other way.

Q30 Chi Onwurah: Thank you very much. Could I ask our other witnesses to respond?

Professor Azoulay: If I might add one element to the question that the hon. Member asked, the programme managers at DARPA and also at ARPA-E—the Advanced Research Projects Agency-Energy—have a fixed expiration date, which means they will need to go back to academia or to the venture capital firm or large firm that they left, and generally they want to do so with their head held high and their reputation intact. I think that that has created over time a norm of correct behaviour, if you will, and the absence of cronyism. That norm element is also very important, in addition to the formal regulations.

Q31 Chi Onwurah: When they go back, are they allowed, for example, to direct finance at the companies to which they return?

Dr Highnam: No.

Chi Onwurah: That is very clear.

Dr Dugan: I served as the 19th director of DARPA and echo Peter’s statements that there are indeed oversight and regulations that govern the behaviour at DARPA. We have free and open competitions. One of the things it is important to understand is that part of the reason that innovation is so robust at DARPA is that there is a sense that there is an equal opportunity for many to apply to the programmes and to be fairly judged. As a result, many bring their ideas to DARPA. That is part of the robustness of the ecosystem that has developed around the agency. It is a very important element of the work.

Q32 Chi Onwurah: Thank you very much for your responses. May I ask one more follow-up question? I have spoken about some of the concerns about oversight

and so on, but may I ask each of you what you think is the key positive element of culture? You have spoken about the desire to return with your head held high. What should we be looking for in the directors and programme managers as the key positive part of the culture that ARIA should seek to build?

Dr Highnam: Honour in public service is top of the list.

Chi Onwurah: Honour?

Dr Highnam: Yes. You join a place like DARPA to change your field and make a difference for defence. We are a defence agency. When you come to DARPA, we give you the lever arm, we help you position the fulcrum, we give you the mass to make things happen, and we give you the processes around you to make sure, as Regina said, you do it fairly, openly and robustly. We do exit interviews when people leave DARPA, and one of my favourite quotes is, “If you don’t invent the internet at DARPA, you get a B.”

Chi Onwurah: Fabulous.

Professor Azoulay: I second that entirely, but I would also say credibility in both the scientific world and the business world. It is a relatively rare breed of individuals who have credibility in both domains at the same time, but that is to quite a large extent the X factor in the typical DARPA or ARPA-E programme manager.

Q33 Chi Onwurah: Thank you very much. Dr Dugan, I will ask you the same question. The tech sector and science and innovation are not known for their diversity, but we have heard that diversity of thought is very important in the agency. As shadow Minister, I would like to see a broad range of diversity in the people who are recruited, in terms of gender, class and race. I am asking this question of you because you are the last person that I came to. How can the culture promote diversity as well as being positive?

Dr Dugan: Let me take the questions in order. I would add that DARPA and ARPA-like organisations are optimised to create breakthroughs. Those breakthroughs happen at the intersection of some science and engineering that we are pulling forward in service to a new capability or a new problem solution. We design the programmes such that we have a very clear and ambitious goal that is also measurable and testable. Programme directors have a finite period in which they collect a group of performers from a mix of organisations and disciplines in service to that goal, and there is passion, spirit and urgency that comes with that. It cannot be created in the abstract; it has to be real in order to engender the kind of genius and collaboration that is characteristic of these programmes.

The programme directors are themselves scientific or engineering experts. They are great musicians, as you might think, but they are not playing an instrument at the time of conducting the programme; they are rather conducting an orchestra of expert musicians who together make a symphony. That is very important.

What I can tell you about diversity from my own experience, both in Silicon Valley and at DARPA, is that for decades we have known that specificity of goal and outcome is a good way to get more equality and diversity in assessment of ideas and in people conducting or pursuing those ideas. We know that across academic institutions and across companies. One of the things

that is important is to set crisp and clear goals, because the ideas are then measured against them, and they can come from many different individuals and organisations. As I said previously, I believe that is central to building that ecosystem out, and for that ecosystem to be diverse and more equitable.

Chi Onwurah: Thank you very much. I know that others have questions to ask so I will leave it there, but I just want to say how inspiring it is to hear such positive reference to the power of public service, science and research, and to oversight as being an enabler rather than a burden.

Q34 The Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy (Amanda Solloway): It is a great pleasure to serve under your stewardship, Mrs Cummins. I want to acknowledge the excellence of our witnesses and to thank them. With your permission, I will ask one question to each witness.

I am going to start with Dr Peter Highnam. How do you ensure evaluation and scrutiny of DARPA’s programmes outside what is mandated in legislation? What information do you gather to assess when to start and stop projects and programmes, and how are these decisions made?

Dr Highnam: That is a surprisingly big question. The p in DARPA stands for “projects”, which is critical for a place like DARPA. We are not doing technology area x or y just because, and we do not do it for the long term. We have projects that are well defined at the beginning. A case has to be made. They are monitored, they have metrics and all manner of independent evaluation associated with them before we go out to find the best teams we can to participate and to be funded to work on that research. Then that project ends. That is very important: things begin, and they end.

To make the case for a project to get off the ground, we use a structure called the Heilmeyer questions, named after the DARPA director in the mid-70s, George Heilmeyer. They are five very important questions. They look easy, but they are very hard to answer well. In my view, that is the creative act in the DARPA model—to answer those questions well and make that case. Once the project is approved and teams are onboard, you then have regular evaluations. As things change in the world around us, in science and technology, with us in defence, and in other aspects of our environment, they may be overtaken by events. That is very rare, but it would be grounds for no longer continuing. Were we too ambitious in certain aspects of the programme? Do we need to change it or change some of the people participating in the teams? And so on.

This is a constant process. It is not about starting it up and letting it run until it finishes. It takes a lot of effort to make sure you know what you are doing when you start with taxpayer funding and the opportunity cost that comes with that. Then you keep an eye on it, especially during the transition of the results to our national defence.

Q35 Amanda Solloway: Thank you. That was a very precise answer to what I know was a very large question. I would next like to come to Regina Dugan, if I may. As you well know, Wellcome Leap was created as a separate

[Amanda Solloway]

body from Wellcome Trust. Why was that decision made and how will it help Wellcome Leap achieve its objectives sitting outside of the Wellcome Trust?

Dr Dugan: The story of Wellcome Leap actually dates back to about 2018, when the Wellcome Trust, from its unique position in the world, asked, “Is there more we could do to have greater impact?” It did a pretty careful analysis of innovation as it happened in larger organisations in the venture world and also at DARPA. The assessment was that in global human health, there is indeed this innovation gap. That innovation gap is characterised by larger programmes with higher risk tolerance, which are not driven by consensus peer review. This is very much the way we conduct programmes at DARPA—the intersection of a goal and the science and engineering that need to be pulled forward in order to attain that goal. That effort—those large programmes—are what Wellcome sought in the formation of Wellcome Leap. What I have observed in the last year of operation is that, in fact, there is this innovation gap in human health. It is same one that was identified after Sputnik that led to the formation of DARPA. The coronavirus is showing us just how much work needs to be done in human health across policy, equity and the economics, but it also shows us the power of a breakthrough and how tough it is to get one.

I was the director of DARPA when the pivotal investments in mRNA vaccines were made. Many others came to the table to create this success for the world in this time, but we need more breakthroughs like that, and we need them faster. That is why Wellcome Leap was formed.

Q36 Amanda Solloway: Thank you very much. That is really helpful. My final question is to Professor Azoulay. In your paper you mention that organisations’ flexibility is essential to the ARPA model. Can you talk a little bit about what that flexibility involves please?

Professor Azoulay: Absolutely, it is essential and I think it happens at multiple levels. It happens in the relative administrative autonomy that those ARPA-like agencies have, relative to their Government Departments of reference, whether it is the Department of Energy for ARPA-E or the Department of Defense for DARPA.

It definitely also happens at the hiring level and in the fact that one can hire programme managers in ARPA-like agencies from very diverse backgrounds, not necessarily a background in the civil service, and pay them according to rules that might not be those of the traditional civil service.

Focusing on programme managers, that matters because they themselves have quite a bit of autonomy in the way in which they delineate and orchestrate their programme. They have a lot more discretion in choosing what projects to fund and assembling the teams that will perform those projects than would be the case in a traditional science funding agency, such as the National Institutes of Health or the National Science Foundation in the United States context or, I would think, UK Research and Innovation in the British context.

The Chair: I call Stephen Flynn, the spokesperson for the SNP.

Q37 Stephen Flynn (Aberdeen South) (SNP): Thank you, Ms Cummins. It is a pleasure to serve under you as Chair. I thank the witnesses for their comprehensive answers so far. They have been incredibly helpful.

I would like to pick up on a comment made by Dr Dugan, I think, in respect of the intersection of a goal, and using science and engineering to achieve that goal. It would appear, from looking at what is front of us, that the ARIA Bill does not have a goal. There is no mission or bright light that we are trying to get to. What is your collective view—all three of you—in relation to that? ARIA has no mission: is that a good thing or a bad thing?

Secondly, and hopefully briefly, do you think that the UK needs ARIA in order to compete globally when it comes to science and technology research and development?

Dr Dugan: Let me start by clarifying. From its beginning, the mission of DARPA has been very simple: to both create and prevent strategic surprise. Its connection to national defence has been important to its success. The particular goals that I spoke about were related to the programmes themselves. The programmes are constructed such that we have a clear way of measuring success or failure for the programme at the end of the programme. It is those two things that fit together: the programmes with individual ambitious measurable and testable goals, in service to the overall mission.

I have said in previous testimony that there is some wisdom in thinking about ARIA as directed to specific areas of interest in the UK; I think that is worthy of some thought. There is a strong base of expertise in the UK related to health and the life sciences. Therefore, that could be an area of focus within the resources that you have available to you.

To answer your second question with respect to the UK on the global stage, I believe that at this moment there is a historic opportunity in front of your Government to take a position on the global leadership stage. My particular area of focus has been in human health over the last year—that might be a way for the UK to come from the perspective of both national efforts and multinational efforts, in service to a global vision for what we want the world to look like post pandemic and post Brexit.

Professor Azoulay: If I may, I would like to answer the first part of the question. I read the Bill carefully, and I too was looking for a mission, because DARPA and ARPA-E are mission-oriented agencies. Having a high-level mission is very important to define the programmes with the specific goals that Dr Dugan was talking about, which will fit in the overall mission. It is entirely possible that ARIA will be something new in the innovation funding landscape—a UK model that will blaze a new trail. But if we compare it explicitly to something such as DARPA or ARPA-E, in its current form it is lacking a high-level mission. To give an example, for ARPA-E that high-level mission is to overcome the long-term and high-risk technological barriers in the development of energy technologies. It is quite high level. Having that front of mind for everyone in the agency channels the energy and lets people animate or catalyse a community to allow the portfolio of projects to be more than just the sum of its constituent parts.

Dr Highnam: DARPA: defence and national security. Clear mission; clear scope in which to work. Of the ARPA-like entities around that I am aware of, the only one that very closely follows the DARPA model would be the Intelligence Advanced Research Projects Activity in the US intelligence community. When you change what I would regard as the key elements—ephemeral or temporary people, project based, and no fixed assets—that have made DARPA nimble and forward leaning for 63 years now, you get something else. That may be more appropriate for what you need, but if the objective is to mimic or replicate, there is only one example that I know, and there are three key ingredients.

Within that model, DARPA is a very shallow place in the managerial sense. Three layers deep: there is a front office, some tech offices and the programme managers. The overall mission provides the context, but the frequent hiring of office directors and PMs, and front office people too, means that there is always exploration—looking for that advantage. Part of our mission is to impose and avoid technological surprise. That is why we are here. It focuses everything.

Stephen Flynn: That is very helpful, thank you.

Q38 Stephen Metcalfe (South Basildon and East Thurrock) (Con): It is a pleasure to serve under your leadership this afternoon, Ms Cummins. Thank you to our excellent witnesses. I am interested in the practical approach. When you have made some breakthroughs on these various high-risk projects, how do you ensure that the breakthrough reaches its full potential? Is it done through the ARPA model, passing it on to someone else to take it to the next stage? Is it the project manager who has a role in ensuring that it goes into safe hands, or is it the churn of people—the revolving door—that helps transfer that knowledge out an ARPA and into business, so that it can create service and product?

Dr Highnam: If I may, I will take the first shot at this one. It is the first two: we do not rely on the churn, as you say, of people for transition, but when you show up—when you come here—you come to make a difference. So you are always focused on transitioning the knowledge that is discovered in a more systems-oriented research programme—the thing or the entity—across into service of the nation. It is part of what you do. I think, as someone said earlier, it is that intersection of managerial and technical expertise, and a passion: those are the people you want at DARPA at any given time to frame and to drive—and not just to drive to discover, but to drive to transition as well. We watch that very carefully and the responsibility belongs to all of us in the agency.

Dr Dugan: We used to say at DARPA—and this is, I think, generally true of most organisations—transition is a full-contact sport, always has been and always will be. It is very difficult. Transitions of breakthroughs that are showing what is now newly possible, or a solution that did not previously exist, require a tremendous amount of effort. I think that it is important to recognise that there are many transition paths that grow out of an organisation that is ARPA-like. Some of the programmes, in the case of DARPA, transition to our military counterparts. Some of them transition to the commercial sector and then are bought back by national security or military. There are many different pathways. In some

cases, programme managers go to other Government organisations to help in those transitions. In some cases, they rotate out and go to new things entirely.

It is important to recognise that the breakthrough itself is not sticky through the organisation that it was created in. The breakthrough then gets transitioned to impact and scale in the most suitable organisation in order to create that ultimate impact. I would add, in addition to the passion that many programme managers and directors feel, they are also impact junkies. They really come to make a difference. So the ultimate transition—the ultimate scaling and impact—is the goal. Make the breakthrough, and then transition it to scale.

Professor Azoulay: I want to note that there is a distinction between DARPA and other ARPA-like agencies in different contexts. I am sure Dr Highnam and Dr Dugan will think that it is an oversimplification, but to some extent there is one customer for the projects that come out of DARPA, whereas for something like ARPA-E it is a much more diverse and scattered ecosystem. The breakthrough needs to latch on to the energy system, and there are lots of different actors with lots of different interests. At ARPA-E that has meant that they have created explicitly a tech-to-market group, to try to get ahead of the translation problem of the project that has come out of the agency. I want to say that this is not independent of the mission. To create a good tech-to-market group, you need a certain scale within a certain scope, and to the extent that your projects are too scattered, it is going to be a lot harder to create that scale, and so harder to create the transitions.

Stephen Metcalfe: Just to follow up briefly, thank you for that; it is comprehensive and helpful. It highlights the fact that you are looking for more than just individuals with some inspiring ideas. They have got to have the ability to own the research and inspire the next stage in its progress. I just think we should put that on record—that programme managers have to be multi-skilled in a number of different areas. So thank you for that.

Q39 Dawn Butler (Brent Central) (Lab): It is great to serve under your chairmanship today, Ms Cummins. Thank you very much to the witnesses today. It is very enlightening. On the back of the last question with regard to managerial content I really like the idea that the transition is an impact or contact sport. You go in, do your best work and get out with your reputation intact. I have two questions about that. First, how do you reach those people who are not known—who may be working on something very creative but are not well known in the industry? Secondly, you have talked a lot about evaluations. Are they peer-to-peer evaluations, and is that evaluation transparent? Perhaps we will go to Dr Highnam first.

Dr Highnam: We do—I am very proud of this—full and open competition to the greatest extent possible. The process is approximately like this. A programme manager has framed a programme, using the Heilmeyer questions, and received approval to launch. They put out various announcements in different places. They organise industry days—these are more virtual than in person, but we do both. We put it into the various mailing lists in all manner of technical communities. We push it out through small business and make sure the

universities and the vice-presidents for research and development are all aware. We make the maximum push that we can, certainly for unclassified activities.

Then, when proposals come in—we are very clear on what we expect to see in a proposal, which is how we then evaluate proposals; we are very transparent on the requirements for that—we take a look and, surprisingly often, to respond to your point, you will find a technology or a small business had an idea that meets the goal. We do not over-engineer the request for proposals. We say, “Here’s what we want to do. Here are the boundaries, if you like, in terms of technical elements we are interested in. It’s up to you guys. Come back with the best team that you can and the best approach that you can for solving this.” And there is always a surprise. From a PM perspective—Regina and I have both been PMs at DARPA—you always find yourself saying, “Oh, I didn’t think of that. That may be the one that actually wins; we don’t know.”

Dawn Butler: I can see Professor Azoulay nodding.

Dr Highnam: On your second point, about transparency, we have, again, very rigorous processes. These are all fully documented, and feedback is provided in order to engender better proposals next time from those who happen to be unsuccessful in a particular programme.

Dawn Butler: Great—thank you. Dr Dugan, I saw you nodding as well.

Dr Dugan: If we want to get down to some specifics, I think it is important to recognise that the evaluation process for us is very much about separating the abstracts or the proposals into two baskets: those that are responsive to the call and could potentially help us to meet the goal; and those that are not. But it is not an explicit, peer-reviewed consensus rank ordering of those proposals, and the reason why we do not do it that way is that rank ordering tends to favour the most conservative of the proposals. What we seek instead is to take those that could contribute to the goal and, from them, construct a programme, with the appropriate pieces, the right risk profile and the right disciplines and mix of organisations, to achieve the goal.

In this respect, I want to be clear. There are practices and principles that we use here. We can write down some of the rules that we use and give you some elements of the playbook, but there is here a certain mastery of practice and principle that it is necessary to understand, and in that respect the programme construction is fair and equitable but also designed to take the elements of the proposer’s work that most substantively contribute to the goal, even if they are potentially high-risk. That is how you construct a programme that is optimised for breakthroughs.

Q40 Dawn Butler: My final question is to you all. How important do you think the link should be between ARIA and UKRI in the UK? Perhaps we will start with Professor Azoulay, because you have read the Bill very carefully.

Professor Azoulay: I think that those two modes of funding are complements, not substitutes. It is very important to have an ecosystem of funding. In the US, we are blessed with a very diverse ecosystem. Lots

of domains, such as health—there are many, such as agriculture—in some sense are missing the ARPA-like elements, when they have a lot of those other elements.

It is important not to put those two agencies in competition; they both have a role to play. Of course, there is a perfectly legitimate debate about the relative levels of funding, but they would both be doing things that are tremendously important and that would complement each other in the long run.

Dawn Butler: Thank you. Dr Dugan?

Dr Dugan: Pierre makes a very good point. These are important elements of a robust and functioning ecosystem. We talked about the advances in mRNA, which have been so important in the corona pandemic. That relied on basic science, curiosity-driven research that happened mostly through NIH, pivotal investments in this breakthrough mode, this Pasteur’s quadrant style of work that DARPA is famous for, and also the private sector, which was instrumental in bringing it to scale, use and impact.

To Pierre’s point, these things have to fit together in order to create the breakthroughs—that is the innovation gap that is often filled by an ARPA-like organisation—but you must have a foundation of science from which to draw and you must have a mechanism of transitioning to scale, if all of it is going to make sense in impact.

It is very important to understand those things and in appropriate measure. Just to give you a sense of it, DARPA has operated with about 0.5% of the DOD budget for its entire 60-plus-year history. Small investments, relatively speaking, in these breakthrough-focused activities can make a big difference.

Dawn Butler: Thank you. Dr Highnam?

Dr Highnam: I am afraid that I do not know enough about your structures to be able to give a sensible answer.

Dawn Butler: No problem. Thank you very much.

The Chair: Next, I have Aaron Bell and then Daniel Zeichner.

Q41 Aaron Bell (Newcastle-under-Lyme) (Con): Thank you, Ms Cummins. It is a pleasure to serve under your chairmanship. I thank all our witnesses and those who gave evidence to the Science and Technology Committee, which was greatly appreciated.

I have two related questions for the panel. First, notwithstanding your responses to Mr Flynn about the need for a mission, which it seems is going to be delivered by the chair and the chief executive of ARIA, how important is it that ARIA remains autonomous and free to pursue whatever its aims are, without interference from Government Ministers?

Secondly, what advice can you give the Committee about the funding methods ARIA might use? The Bill envisages potentially grants, loans, prizes, grant-prize hybrids, investments in companies. Could any of you give us advice on what has worked well in other settings? I would like to start with Dr Highnam, please.

Dr Highnam: On the funding mechanisms, we are an agency in the Department of Defense in the US Government, and we have a number of options available to us, which we make use of depending on the context.

Of those that you listed, the only one that we do not do is take investment positions in companies. That is not what we do. You can make a proposal to us for research. You may offer a cost-share, depending on whether it is a major company and very systems-oriented work, all the way to a standard research grant to a university or small business, or a combination of those things.

We have a number of other options in between, including a modified form of commercial contract called an OTA—other transaction authority. They are referred to as OTs and are a very useful tool. DARPA was the first user of that about 20 some years ago. It is a great way of doing business.

To the first question, we are an agency in the US Government. We work in the Executive branch. We work and deal closely with Congress on all manner of things. We have flexibilities as an agency. We have ways of doing business and we are very careful to make sure that the wins that we achieve are well-known, and that we work within those boundaries. Again, the Administrations and Congress over the years have watched and helped DARPA, and have been incredibly supportive. The agency—Regina and I can both say this—keeps delivering as a culture and a mission place, because back in '57,'58, they got a good recipe, and that culture persists despite 25% or higher personnel turnover. It is part of the Government, with all the benefits. All the—"constraints" is the wrong word—rules that come with that are there for a reason, and DARPA gets the job done.

Q42 Aaron Bell: Thank you. Yes, the culture is so important. Dr Dugan, could you answer on the point about autonomy and funding mechanisms?

Dr Dugan: I want to attach independence and autonomy to desired goals and outcomes here. The reason the agency sits so independently with respect to its decision making is to find this intersection, and get through the Heilmeyer questions, as Peter has talked about. I would often refer to it as figuring out how to get a project inside Pasteur's quadrant—the idea of having a very specific outcome in mind and having the science and engineering to support the idea that you could achieve it. That is a difficult analysis. That is the creativity that Peter is talking about.

You cannot mandate that from outside the agency. That work happens on the part of the technical teams inside the agency who are assessing the state of the science and the engineering. They are working in service to the mission of the organisation with an understanding of national security goals, and they are finding that intersection. It is the single hardest thing that we do in the agency: forming programmes in that spirit. It is not possible to do that by mandate outside the organisation.

That independence of decision making and the crafting of those programmes in that spirit are coupled, and that is part of the reason why the agency has been so successful over years. I think independence is in service to those outcomes and those breakthrough objectives.

Q43 Aaron Bell: On the funding streams, could you perhaps tell us a little about how Wellcome Leap works with other bodies to fund or otherwise encourage research?

Dr Dugan: Much as Peter described, we use a variety of strategies. As you may have seen over the last year, one of the things that we did was to build a health

breakthrough network, which now has almost 30 signatories on six continents. The goal there is to speed contracting, so that we can move down to days or weeks what would more typically be months or even as long as a year in contracting. The particular way that we work is through contracts; we do not actually do grants. I also think that this position of not taking equity is important, because the non-profit element of it is part of the differentiation, and we have an entire commercial sector that is good at assessing value and figuring out return on investment. That is not what is pivotal or differentiating for the organisation—neither for Wellcome Leap nor for DARPA.

Q44 Aaron Bell: Professor Azoulay, would you like to comment on either the autonomy point or the funding mechanisms?

Professor Azoulay: Yes, absolutely. First, I second what my colleagues have said and agree wholeheartedly. I would say that in terms of the modes of investment, the track record of Government agencies taking investment positions in companies is not very good, to put it mildly. It is interesting that it is something that neither ARPA-E nor DARPA actually does.

At the same time, it is important to point out that one way for an ARPA project to transition is to give birth to a start-up company. I know for a fact that in the context of ARPA-E, at least, that is something that is happening on a fairly regular basis, and that is actually tracked as one of the outcomes that one could look like, in addition to maybe much more traditional intermediate outcomes such as scientific papers and patents.

The more general point about autonomy is very important. It is really difficult. It requires forbearance on your part because the kinds of missions and impacts that you are trying to achieve at a very high level are long-term goals fundamentally. I might be overdoing it, but I have a sense that if you start ARIA today, you will not know if it has actually fulfilled its high-level mission for at least 15 years, and that might even be too optimistic.

Aaron Bell: Understood. Thank you.

The Chair: Next we have Daniel Zeichner, followed by Jerome Mayhew.

Q45 Daniel Zeichner (Cambridge) (Lab): It is a pleasure to serve under your chairmanship, Ms Cummins. I thank the witnesses for what has been an extremely interesting insight so far. I represent the city of Cambridge, where, as you can imagine, many of these issues are a frequent source of discussion. From what I have heard so far, I take it there is not one model of ARPA. You have a number of models, depending upon the different sectors. I heard Dr Highnam say earlier that DARPA had not been replicated anywhere else, yet we are trying to model our system on what you have got. How much does it depend upon the context, not just within the sector and whether it is ARPA-E, ARPA-H or DARPA, but in the wider system? We heard from witnesses earlier today about other aspects of the ecosystem—public procurement, things such as the Small Business Research Initiative, which I understand we have a much less successful version of in this country, and having a single client or defence system. If you do not have clarity on any of that, what would be the consequences? Perhaps I could start with Dr Highnam.

Dr Highnam: I said in my previous comment that I am aware of only one example that replicated DARPA intact, and that was the intelligence ARPA in the US, where I served for about six and a half years. It is very true to DARPA as it stands. Others depend on context, which includes the context of discussions like this one where there is certainly the framing of an organisation. It is being pulled and pushed and moulded by many different forces and interests. What you get coming out will, I am afraid, naturally reflect that. In intelligence here, it was a straightforward thing. We wanted something very similar to DARPA. A number of us had come from DARPA and knew what that was.

Daniel Zeichner: Professor Azoulay?

Professor Azoulay: ARPA-E is not identical to DARPA, but we certainly try to inspire it to a very large extent. I think the difficulty here is that it is a tight bundle of practices that fit together, so one open question is to what extent can you pick and choose in terms of the menu of practices? What can you undo until you in some sense undo the entire model? It is important for us to level with you that we do not really know the answer to this question, because fundamentally there has been one DARPA, and that is the one we have been able to see for 60 years. One possibility that we might want to have in mind is that it does not take a lot of changes in the model to undo its effectiveness.

Daniel Zeichner: Dr Dugan?

Dr Dugan: I agree with what Pierre just said. I might use an analogy if you will permit me. I think most would agree that Guardiola is a great coach. We could ask him how he has achieved the track record of wins and successes that he has. How has he envisioned a new style of play, constructed a team, coached the players, made decisions on the way in? He could write down some of the principles associated with that. On a day-to-day basis and across the duration of a season, he makes countless decisions, which are in service to these basic principles that create such a winning team. It is those detailed decisions that come from intuition and experience—the mastery of the practices and principles as Pierre would say—that are important to success.

At Wellcome Leap, for example, our first rule is to make as few rules as possible. Part of that is recognising that we have these practices and principles and we need to adjust a lot as we go along in the process. In setting up Wellcome Leap, I think Wellcome did a very good job of saying, “We are going to do the few things that we think are central. We need independence and governance. We need an experienced team to lead it. We need to free it from a profit motive, and then we need to let it do what it does.”

So there is this combination of a few principles that we can write down for you and then many other things that are about the practice of that come from the intuition and experience of leading these types of programmes to breakthroughs.

Q46 Daniel Zeichner: Just to come back on one point there, you say free it from the profit motive. I was quite struck through all of this by this stress on public service and honour, which is wonderful—perhaps we are struggling a bit with that here at the moment. Who owns the intellectual property on all of this? It is a complicated question. Is there a simple answer?

Dr Dugan: The organisations that create the breakthroughs own the intellectual property in the case of Wellcome Leap, and that is usually the case in DARPA. Now we usually also have a backstop, which says we have march-in rights if the entity either chooses not to commercialise it or to transition it to impact. Then we would go and say, “We need to take this in service of national security,” but at its core the intellectual property belongs to the inventor of the breakthroughs.

Dr Highnam: One addendum to that is that we have a notion here of Government purpose rights. Yes, the invention is owned by the creator, but if you receive DARPA funding and the appropriate terms are in the paperwork and the arrangement that we have with you then there are limited rights available to the US Government for those inventions.

Dr Dugan: Just to clarify what Peter is saying, those limited rights are about making sure the invention can be practised in service of national security.

Daniel Zeichner: That is really helpful. Thank you.

The Chair: I am afraid this will probably have to be the last question to this set of witnesses. I call Jerome Mayhew.

Q47 Jerome Mayhew (Broadland) (Con): We are clearly taking a huge amount of inspiration from DARPA in the creation of ARIA. It is an organisation that has many strengths, but every organisation has weaknesses as well. I would like to give you the opportunity, given your huge knowledge and experience of DARPA, to give us advice on what to avoid. To put it more diplomatically, how can we improve on some of the DARPA processes?

Dr Dugan: One can look at any set of processes and ask, “Are they optimised for the outcomes?” I think ARPA-like organisations are very much optimised for the outcome, which is to catalyse breakthroughs. It is not optimised, as my colleagues have said, for multi-decade-type funding that supports basic research that is foundational and builds a body of knowledge and extends incrementally our understanding of the world. Neither is it optimised for commercial success. I think those things are okay, and there are other organisations and other funding mechanisms that are optimised for those types of activities.

Part of what we see is that the programmes very much take on the character of the programme directors. That is good from the perspective of speed, agility and getting the work done. Sometimes people do not agree with all the things the programme director says. That is the nature of the type of work we do, which is high-risk and breakthrough-oriented. We used to say that the good and the bad of DARPA is that it has no institutional knowledge, which means that we can take a shot at something that has been tried before, and most of the people who tried it before are no longer at DARPA. That is good, as it gives us multiple shots on goal in a changing science and engineering landscape.

Q48 Jerome Mayhew: Finally, to Professor Azoulay, DARPA clearly recognises the benefit of greater integration between the public sector and the private sector, but inevitably that exposes civil servants to political accusations of cronyism. How do you protect DARPA and DARPA servants from those kinds of attacks?

Professor Azoulay: I think there are two elements. One is rules—conflict of interest rules are very important in this regard—and the second, which I mentioned at the beginning, is norms. It is a lot about whom you choose to put in those roles. They typically have credibility and a reputation that is established in the world that they come from—it could be academia or the private sector. Serving as a programme manager at DARPA or ARPA-E is a wonderful opportunity to have an impact—

The Chair: Order. I am afraid that brings us to the end of this session, I am sorry. It is a perfect end to the session, but it is the end of the time allocated to the Committee to ask these questions. I thank our witnesses on behalf of the Committee for that evidence. Thank you very much.

Professor Azoulay: Thank you. It was a pleasure.

Examination of Witnesses

Professor Dame Anne Glover and Tabitha Goldstaub gave evidence.

3.1 pm

Q49 The Chair: We will now hear evidence from Professor Dame Anne Glover, president of the Royal Society of Edinburgh and special adviser to the vice-chancellor of the University of Strathclyde, and Tabitha Goldstaub, co-founder of CognitionX and chair of the AI Council. Could you both introduce yourselves, please? We have until 3.45 pm for this session. Welcome and thank you.

Professor Glover: I am Anne Glover. I have just finished my three-year term as president of the Royal Society of Edinburgh, so I am no longer president of Scotland's national academy. I am a molecular biologist by background. I have researched how we respond to stress at a molecular level, and I have looked at the diversity of microbes in the environment. I am very interested, and have worked in translating knowledge gained from research into policy making, and as such I was chief scientific adviser for Scotland from 2006 to 2011 and chief scientific adviser to the President of the European Commission from 2012 to 2015. I am currently at the University of Strathclyde.

Tabitha Goldstaub: I am Tabitha Goldstaub, the co-founder of CogX and the chair of the UK Government's AI Council. We are an independent council created in 2018 as part of the industrial strategy's AI sector deal. We support the Government via the Office for Artificial Intelligence, our secretariat, in offering independent expert advice, as well as community engagement. I am really here to share the thoughts of those I polled and workshopped with from that AI community. Thank you very much for inviting me.

The Chair: Thank you very much, both, and welcome. Our first set of questions will be from shadow Minister Chi Onwurah.

Q50 Chi Onwurah: Thank you very much to our guests for joining us and bringing your experience. It is a real pleasure to have an all-female panel. It is a real rarity when it comes to discussions of science generally.

There is some confusion about what ARIA should be. Should it be focused on cutting-edge research, should it be about the transformational translation of existing research, or should it bring the two together? What I would like to know from both of you, with your wide experience, is what you think ARIA's goal or purpose should be. What problem should it fix?

Ms Goldstaub, you have experience of artificial intelligence, which could be a critical area of research. Do you think it is going to change the nature of research, how we research and how scientific research occurs? How should we envisage ARIA responding to that?

Tabitha Goldstaub: First and foremost on your point around focus, really it needs to be about imagining how funding is done to find the breakthroughs that others describe as being at the edge of the edge, with freedom—testing, for example, things like the lotteries, the grants, the speed of contracting, loans, prizes and all the things that we have heard about throughout the whole of today. I really think that ARIA is about exploring these ideas.

If you are looking for a single focus, I believe wholeheartedly in Mariana Mazzucato's mission-driven approach to innovation. The AI community was incredibly catalysed by the industrial strategy grand challenges. And of course there are these urgent missions. Alondra Nelson said in her first speech post being nominated by Joe Biden that all science should address social inequality. That said, it is still unclear to me if there needs to be one challenge enshrined in law or whether the programme managers should have the freedom; I think we will hear more from others on what their decision is there. The most important thing is that I just kept hearing time and again from the community I spoke to, similarly to what the gentleman from DARPA said, that this is a time to serve. People really want to find a place to do research that saves people's lives, especially in the AI ecosystem.

I think that your question about the impact that AI has on research is a very good one. AI is impacting research, just as it does all areas of the economy, both in disrupting the fabric of its own self and advancing research. We have seen AI create state-of-the-art information-retrieving capabilities, sift through vast amounts of data and speed up the publishing process, so it is changing the process of research, but also in itself it is obviously making discoveries and scientific advancements.

Three per cent. of all peer-reviewed journals are now AI-related and this new trend of AI plus another science is really booming. So biology is currently experiencing its "AI moment". We saw in the State of AI report that there is a 50% year-on-year increase in papers; 25% of the output since 2000 is a biology and AI collaboration. DeepMind's AlphaFold is a really good example of that. Demis Hassabis has publicly said that one of the drivers at DeepMind is AI that could win a Nobel prize, so he has already set the bar for an ARIA.

Q51 Chi Onwurah: Thank you very much. And Professor Dame Anne Glover?

Professor Glover: You were asking if the UK's ARPA or ARIA should have a single purpose, or focus, and in terms of subject area, I would argue not, because you do not know where the good ideas are coming from. It would be really valuable to have quite a wide and

informed debate from a very broad spectrum of interests as to where the calls should come from regarding ARIA. Therefore, when they are looking for a call for research, what are the big areas? In a way, this is quite similar to looking at the grand challenges, which Tabitha has already mentioned.

However, there is an opportunity here in looking at grand challenges, because who decides what those grand challenges are? Voices that are very frequently missing in that debate are citizens' voices. If I think of some of the big grand challenges—certainly a number of those were funded at the European Commission—often they would be narrowed down, so that there would be three absolutely superb proposals in quite different areas of research, which would have come through the review process. Then it would be a decision about which one we should fund. And that is an ideal time to say to citizens, “What is it that you're interested in?”

Of course that makes the research very relevant; it would tend to make it translatable into the economy, the life/wellbeing environment and so on; it also then has a substantial buy-in from citizens. That is not unimportant, because at the moment we are enjoying a big buy-in from citizens around science, as they see the relevance of what funding science over a period of years actually does, in being able to deliver us—in this case—from a pandemic, and of course there is climate change there, as well. So that is important.

The focus of the purpose needs to be crystal clear, so that there is no confusion with other funding agencies. That would just lead to mini-chaos, or things falling through the gaps and being shuffled around, which is not at all helpful.

The last thing I would say in this context is that there is an opportunity to look at how you fund. For perhaps quite understandable reasons, current research funding is quite formulaic; it is box-ticking to get the funding. What sort of projects will be funded? Normally, low risk. There is an opportunity to look at high risk, high reward. I would hope that the leadership of ARIA considered that, to fund things that are really innovative, you yourself have to be innovative. We will need to think and be imaginative about how you go about sourcing and funding projects, so that we do not just get a modified version of what we are currently seeing, but can fund in a way that is more bespoke. By doing that, we are opening up what I hope would be exciting possibilities.

Q52 Chi Onwurah: Just to follow up with two brief questions. The points you raise, though different, have raised similar questions in me. First, in terms of deciding what areas of research and challenges should be addressed, what if we rely on the leadership, as you suggest, Professor Dame Anne? What ARIA seems to support is what I would call the “big man” model of research: choose five or six great men—generally, they are men—and give them the freedom to be geniuses and to choose what they want to research, to have, as Dominic Cummings says, “extreme freedom”.

Ms Goldstaub, you say that AI is changing how research happens, and also the scale, I would say. Is it possible that we can find five or six great people who know all the different potential areas of research, who can make these kinds of choices on behalf of the British people, using public money, and can integrate the changing

nature of research, while at the same time being innovative and having, we would hope, diversity of thought and hopefully also of gender, region, discipline, etc? Is it possible to find five or six people like that? What elements of the structure of ARIA are important to promote that?

Tabitha Goldstaub: It is totally possible to find those people. I cannot speak across all science, but I definitely feel there is a generation of young, mid-career AI talent that feel they are in a sort of gap—the fuzzy middle, as Andy Hopper calls it. They are asking themselves, “What am I doing? The planet is burning, I don't want to work at the big banks or the big tech giants.” They want the academic freedom of the universities but they do not want to work alone. They see the financial reward of successful start-ups, but they want to take long-term bets. Generally, they want to make the world a better place.

It is people like that who fit into the mould that we are looking for. I worry also about the lone genius model. We are well beyond individual success being seen like that. This is all about community. One of the things I have heard time and again is that people do not want to be funded as individuals but as groups of people. It is a community that would come together around a programme manager that is really important.

Yes, we have to find four or five of those individuals, but it is the people who work with them who make a huge difference. It is the open science, open data and spirit of openness that will go a long way to finding those people who will culturally fit and enable us to engage well beyond just those five individuals and find the edge-of-the-edge breakthroughs that we really need. I hear people saying, “I have ideas that I just don't even put forward right now; they are unthinkable, because they are unfundable.” Once people can come together, you start to unlock that, which saves you from this lack of diversity where you are just funding individual after individual and effectively asking people to compete with each other.

Q53 Chi Onwurah: Thank you. Professor Dame Anne?

Professor Glover: Just for easiness, can I ask Committee members to just call me Anne? Otherwise it is a bit of a mouthful.

On the idea of five or six individuals, I would caution on that slightly. I am partly bought into the idea, but if you are identifying five or six individuals, you have already pinned your colours to the mast in what you want. You have already prejudged the areas you want to work in or the ideas that you are interested in.

Where the five or six people might be really important to identify is for the running of ARIA itself. Whether it is the overall director of ARIA or the research leaders in the different themes that might be funded in ARIA, they will be key people and they need to be credible, trusted, very effective at communication and really open-minded. In my view, a large part of the success of ARIA will come from having quite inspirational leaders throughout.

In terms of how you fund and who it is that you are funding, I would go back to what I was alluding to earlier. There needs to be a big conversation about this. There are often older men who have got a reputation in

research, so they are naturally the ones we go to, but as I know from bitter experience, as you get older, sometimes your thinking closes off in particular areas and you are less open to ideas. I am thinking of Professor Donald Braben, whose comments the Committee would probably be very interested in. He set up a venture research unit in BP, back in the '90s I think, and has written several books about this kind of blue skies research area.

What Braben said is that we should look for “irreverent researchers and liberated universities”. Do not look for people who have a research area that we think is really important and we must go there. Debate widely among researchers, of course, but also Government Departments, devolved Administrations, foresighters, businesses, citizens. Let us imagine the future. ARIA could be the stepping stone, if you like, to inventing that imagined future. For a future to exist, you have to imagine it in the first place and you have to convert it into what you would like. There are lots of different ways of doing that. With inspirational leadership, you can move towards that. You can probably increase dramatically your chance of getting it right by having an irreverence around what you do, and not the usual measures of success.

Q54 Amanda Solloway: Thank you to our great witnesses. I have one question for both witnesses. What is the importance of giving ARIA independence from Government and Ministers, compared with other parts of the R&D system?

Professor Glover: I would argue that there is huge value in that. Obviously, the funding is coming from Government, but by giving it freedom from Government you might also be giving it the freedom to fail in many ways, and that is exceptionally important. If it is seen as very close to Government—whichever Government is in power—it potentially becomes a bit like a political football, either in what is being funded or in the direction suggested for where ARIA funding should go.

If there are notable failures of funding, which you would expect if it were a high-risk, high-reward funding agency, political opponents will also say, “Well, look, this is a complete disaster under your custodianship. Here are all the failures.” You just want it to be separate from that. It is also part of trying to embrace the unthinkable, if you like, in terms of the research we do and the areas we go into. Necessarily, those will sometimes be difficult areas, and not ones that you should expose Government to either. In the spirit of opening everything up, I would say that keeping that independence is extremely valuable.

Tabitha Goldstaub: I totally agree with what Anne just said—I would have said exactly the same thing. I think that the separateness and independence are really vital to the success of ARIA. The only thing that I would really think about adding here is how important it is that ARIA does have a relationship with Government, because it will need to have many customers, both private sector and public sector. The programme managers will need to create those bonds with central Government Departments individually.

I think that a commitment from Government to remain independent but to become good customers is very important. The health and transport sectors are good examples of where that might work. What is different is that a surprising number of these next big scientific fields, and these next big breakthroughs, such as artificial

intelligence, are going to depend on systemic transformation, where you cannot separate the technology from the policy and regulation.

So yes, ARIA has to be independent, but it also needs to ensure that it works really closely with central Government and with regional and local government. Local government spends about £1 billion on procurement, and cities are key investors in infrastructure, so finding a good link with local government, as well as with central Government, is important. This will hopefully end up creating, as Anne suggested, a way that people feel part of this. Regional strengths deliver benefits to actual localities. Even if it is within the next 10, 15 or 20 years, it is really important that government feels part of that, even though ARIA is independent.

Q55 Stephen Flynn: Thank you, Tabitha and Anne, for your detailed responses so far. I have a couple of points, if I may. I think it is safe to say that you seem broadly in favour of ARIA, and you think it will perhaps fill a void. In terms of the resources that ARIA will have, we heard earlier today about the benefits of being a small, agile agency, and £800 million is being allocated. Do you feel that is sufficient for ARIA to meet its needs?

On independence from Government, from looking at your bio, Anne, I can see that you have worked for a few public agencies. If ARIA does not have the public contract regulations and freedom of information in place, will that free it to do what it needs to do? Should we see that as a positive as opposed to a check imbalance, given that we are referring to public money?

Professor Glover: I will deal with that point first—it is an exceptionally interesting point. Initially, when I saw that it might not be subject to FOI, I was thinking, “What are the pros and cons of that?” There is one thing that needs to be fundamental in ARIA, and that is an openness and transparency about what it is funding and why, and how it is doing it. For most things—UKRI would be similar to this—what you provide information on obviously cannot be something that would break the General Data Protection Regulation or that would be commercially sensitive. That should hold exactly true for ARIA as well.

There needs to be some thinking around the whole aspect of openness and transparency, because that brings along with it trust and engagement. If there were any suggestion that Government funding was going into ARIA and it was being syphoned off into particular areas, and we could not find out what those areas were, there would be nervousness. People would, quite rightly, object to that, so there would have to be some greater thought given to how the agency is able to be open and transparent. It might be writing its own rulebook in that area, about what it will provide information on and what it should not.

On whether £800 million is enough, you are asking a scientist and a researcher here, so no, it is never going to be enough, but we have to start somewhere. I cannot make a direct comparison with DARPA's funding, which is about \$3.5 billion or \$4 billion per annum, but I might be a bit out of date on that. It does not seem unreasonable to me to start at that level of funding and to start off on the journey to see what is and is not working, where there is greater demand and where you

might need more funding to meet it. What you would want to see is that this was such a success that there was substantial demand for funding.

On the other hand, you do not want to get into the situation that standard research funding has—I have certainly visited it many times during its lifetime—where you are putting in 10 research proposals to get one funded. That is an enormous waste of everybody's time, including the agency that is funding the research. There needs to be a balance between how much money is available and what you hope to do with it.

The last thing I would say is that how that funding is apportioned needs to be carefully thought out, because there needs to be some security of funding. Traditionally in the UK, we have normally had three-year tranches of funding. Long before the end of the three years you have to try to think about how you get continuation of funding. You might hope that ARIA could look at a different model of funding, which might span different timescales depending on what the nature of the project was.

Many projects, particularly ones that are quite disruptive in thinking, will not deliver in a short period—two or three years—of time. Some could do, but some will not, so there needs to be that security of funding over different annual budgets to allow the investment over a period of time.

Tabitha Goldstaub: I will start with the amount of funding. I see the £800 million as just a start. I think that £800 million is sufficient as long as ARIA works in partnership with Government Departments, the private sector and other grant makers. ARIA should not be restricted in matching or exceeding the Government funding with funding from the private sector. There are people in the community that I have spoken to who think that for true intellectual and financial freedom, ARIA should be able to more than double the Government funding. It was good to see in the Bill that the potential for ARIA to take equity stakes in companies and start-ups in a venture fashion could lead to increasing that part over time and making more funding decisions. I see the £800 million as really just a starting point.

On freedom of information, I agree with Anne that openness is key. Transparency fosters trust, and I do not think there is any need to stop freedom of information. We need to keep freedom of information to help with the efforts for connectivity. If the community are going to feel part of ARIA and will it to do good things, they need to be able to use freedom of information. I cannot see any argument against this for the administration costs. Earlier this morning, we heard Ottoline Leyser say that UKRI gets 30 requests a month. If ARIA is 1% of the budget of UKRI, perhaps it could get 1% of the requests, which would be fewer than four a year. I cannot see it, for that reason.

The other reason why there is a desire for secrecy and no FOI is that people traditionally are not comfortable to innovate and fast fail in the open, but that is changing. DeepMind has teams. I have spoken to Sarah Hunter, who is at Google's moonshot factory, X. She explained how they started in secret and everything felt so appealing, to protect people from any feeling of failure, but what they learned is that there are so many other much better ways than secrecy to incentivise people and to give them

the freedom to fail. Actually, allowing for more transparency builds much more trust and encourages more collaboration and, therefore, better breakthroughs.

Anne has spoken about the community. I definitely will speak again about the community, but in addition to the community engagement, ARIA will need to have a press department and media engagement teams that are separate from BEIS, separate from the grid and separate from the Government, to enable it to be agile in its communication and foster a two-way conversation. In order to answer your question, I really think this is the key point: openness and transparency create more trust and more breakthroughs.

Stephen Flynn: That is really helpful. Thank you, both.

Q56 Stephen Metcalfe: Good afternoon and thank you for joining us and for your excellent contribution. Anne, you made a very interesting point about the independence of ARIA, to avoid it being used potentially as pointing at political failure. If you are investing in high-risk, high-reward research, there will be failure—that is undoubtedly true. May we ask for your advice on how we should measure the metrics of an ARIA over the early years, before potentially there is any output that has demonstrated a transformational benefit to society? On top of that, could you give us some advice on advising project managers on how they should go about selecting projects to explore? Should it be just on the basis of interesting science, or should there be a vision of the commercialisation of that science at the end, to motivate them? We are only going to be able to fund a certain number of projects, and presumably applications will outstrip the funding fairly quickly.

Professor Glover: How we measure success in the early years is a very important question. I am not going to give you an exact answer, but what I might say is that maybe we should not try. That would be unusual, wouldn't it? That is what I meant earlier about not just following the formula of, "You need to tick these boxes to demonstrate success." Of course, you would hope that whoever is leading ARIA would have an idea of how you are developing the innovation ecosystem that will be supported by ARIA. They might have some ideas about numbers of applications, where they are coming from, and having a good look at and analysing that, and looking at the amount of interdisciplinary or multidisciplinary research that comes forward. That is always quite hard to fund. Historically, when I have been involved in such things, interdisciplinary research tends to get kicked around different agencies: "This is more for you." "No, this is more for you." Everybody is worried about their budget and thinks, "If you fund it, we won't have to fund this from our budget." Thinking about the number of applications that could come from a broad range of different disciplines—that would be good. I am not answering your question directly. I am just saying that it is very easy to say, "Let's have a way of measuring success," but sometimes that can be stifling.

It is a bit like—perhaps not in the years timescale of ARIA—how it is around the time of year when we plant seeds in our garden or wherever. If you want to measure how well a seed is germinating, if you keep pulling it up and having a look at it you are really going to set it back, so sometimes you just need to think,

“I’m hoping that in four or five months’ time this is going to be a broad bean plant with broad beans on it. I just need to wait and see.” I know that that is difficult to do.

The second thing you asked is about commercialisation. I cannot for the life of me remember who said this, but someone once said that there are two types of research: applied research and research not yet applied. That is quite true. There might be some areas where you think that there is a very easy market for this, but if we look back and learn from experience we find that an awful lot of research has been developed. The whole area of medical diagnostics, for example, was pure research. There was no commercialisation; it was just a fundamental biological problem that was being investigated. Some of the outcomes of that research led to molecules called monoclonal antibodies. It is quite a beautiful specific diagnostic—supremely sensitive—that can pick out particular molecules of interest that might tell you if you have a particular disease or have been exposed to a particular compound or whatever.

In renewable energy or an area around that, you might understand that there will be a lot of potential commercial partners and opportunities. In some other areas, perhaps not. This might be an opportunity to think about what the relationships would be like between ARIA and existing research funding, because it might be part of an ecosystem. I would hope that there were distinct roles for UKRI and ARIA but very good communication between the two, as well as very many other stakeholders, in order to identify areas that might not be suitable for UKRI funding but that might have a strong commercial or development potential that ARIA would be much more adept at supporting.

Q57 Sarah Owen (Luton North) (Lab): It is a pleasure to serve under your chairmanship, Mrs Cummins. Anne, you talked about citizen buy-in. That would take an element of trust, so my two questions are around that. What could or would good transparency look like without stifling innovation, in both of your opinions? Secondly, if we do not have FOIs and we do not know precisely how this will be reported to us, do we need an ethical baseline to ensure that we are spending public money on the greater good?

Professor Glover: On the citizen buy-in, I think that would be reasonable to consider achieving. I do not think that it would be insurmountably difficult in many ways. If I give you the example of some of the grand challenges that were funded at European Commission level, it was getting down to three brilliant projects. Which one will we fund? If the European Commission made the decision about which one was going to be funded, inevitably different member states would complain: “Why is that getting funded in that member state? This other project was just as good.”

All sorts of problems can arise. Whereas, if you asked European Union citizens which one they would like to be funded, they would say what matters most to them. That is quite an interesting insight into the mind of the European citizen, or it would have been, in that particular instance.

I do not think you are in any way betraying confidences; you are talking about whether it is a project looking at delivering limitless amounts of sustainable energy, or a project in mapping the functioning of the human brain,

so that you might be able to exploit that in other ways. You are not saying how you are going to do those things; you are not revealing confidences or information that would be inappropriate or undermining of those doing the research. I think we might be worrying needlessly about that.

As to the ethical baseline, of course this has to be ethical. Tabitha and I are probably agreeing too much with each other, or perhaps we are going back to the same thing. If you are not open and transparent, you will have problems. That is just not rocket science. For example, there are many agencies that are not part of Government but that might receive governmental funding. Scotland’s National Academy, the Royal Society of Edinburgh, is one of those. We are completely independent from Government. We get funding from the Scottish Funding Council, which gets its money from Government. We are not subject to FOI requests but we voluntarily behave as if we are. If we did not do that, people would say, “They’re being directed by Government, so the reports that come out of the RSE will be influenced by Government.”

If we say, “This is how we approach it,” and if somebody comes to us and asks for information, we behave as if it were an FOI. It has never been too onerous. The only onerous time for me with FOI requests was when I was chief scientific adviser to the President of the European Commission, when it became unrealistic, because I had such a small team and there was such a lot of FOI requests. Generally, that is the direction we should be moving in. You do not want to hobble a new agency by making it seem that any aspect of it is secretive. To be able to demonstrate ethical compliance, you need that transparency.

Tabitha Goldstaub: Ethical transparency is key, but we also have an opportunity with ARIA to set a robust, rigorous ethical review process that is fit for the AI era. We do not currently have that.

There has been a tremendous amount of attention on the public-facing ethical principles and frameworks for assessing AI products, but relatively little on the frameworks and practices for assessing research, or how to launch and manage a data science and AI ethics review board, in any way that would cut across disciplines, organisational, institutional or national boundaries, as ARIA would need to.

If ARIA can work with others, such as the Health Foundation, which is in collaboration with the Ada Lovelace Institute, or the Alan Turing Institute, on this problem, ARIA could achieve its mission responsibly, become a beacon for other ARPA-like programmes, and tolerate failure much more safely; because ultimately we need to break new ground and to do so with an ethics review, specifically with research that has anything to do with artificial intelligence. It would enable us to set real international standards, if we can get that right. It is both a risk and a huge opportunity for ARIA.

The Chair: Virginia Crosbie. I am afraid this will have to be the last, very quick question.

Q58 Virginia Crosbie (Ynys Môn) (Con): Thank you, Chair. It is a pleasure to serve on this Committee. I, too, thank the panel. Tabitha, it is lovely to see you again. You are an inspiration to so many, especially women.

[Virginia Crosbie]

My question relates to both your expertise and experience in encouraging the next generation of visionary innovators. What do you see as ARIA's role in future-proofing the next generation? In Anne's words, they are the future generation of irreverent researchers. How can we ensure that that is spread equally across the four nations of the UK?

Tabitha Goldstaub: Anne made it so clear that it has to be about engaging with citizens—directly with citizen scientists, but also with citizens who do not care about this yet; we have a real opportunity to excite them. A lot of people say it is really hard, but my answer to that is that it cannot be harder than protein folding. Ultimately, the big challenge for ARIA is to engage with those citizens.

Professor Glover: Briefly, of course I agree with that, but the biggest challenge might be—this will help in engaging with citizens—being up front right at the very beginning that we expect failure, and that failure is part of the measure of success for an agency like ARIA, because if you were not taking any risks, you would not get any failure. The challenge is that, culturally in the UK, and quite differently, I think, from North America, we see failure through an emotional lens, not a scientific lens, whereas I think the opposite is the case in North America. We need to think about that. In a way, just talking about it and saying that that is the case makes it easier for people to understand that we need to fail in order to get the big rewards.

Tabitha Goldstaub: I have heard Anne say in the past—

The Chair: Order. I am really sorry, but I am afraid that that brings us to the end of the time allocated for the Committee to ask questions of this panel. I thank the witnesses on behalf of the Committee for their evidence.

Tabitha Goldstaub: Thank you. Good luck.

Examination of Witnesses

Adrian Smith, Felicity Burch and Professor Sir Jim McDonald gave evidence.

3.46 pm

Q59 The Chair: We will now hear oral evidence from our fifth panel of witnesses, which comprises Adrian Smith, president of the Royal Society; Felicity Burch, director of innovation and digital at the Confederation of British Industry; and Professor Sir Jim McDonald, president of the Royal Academy of Engineering. We have until 4.30 pm. I would be grateful if the witnesses please introduced themselves for the record. I believe we are waiting for Professor Sir Jim McDonald to appear.

Adrian Smith: I am Adrian Smith, president of the Royal Society, and I have a day job as director and chief executive of the Alan Turing Institute, the national institute for artificial intelligence and data science.

Felicity Burch: I am Felicity Burch, director of innovation and digital policy at the CBI.

The Chair: Thank you very much. I think we are still trying to get Professor Sir Jim McDonald online. We will start off with Chi Onwurah, our shadow Minister.

Q60 Chi Onwurah: As my first question was for both the Royal Society and the Royal Academy of Engineers, I will start with a question to Ms Burch. Neither the ARIA Bill nor the explanatory notes refer to private sector investment. Is that an issue, and is it possible for ARIA to achieve its mission without engaging with the private sector? Can you suggest improvements to the Bill or its context in order to ensure that that happens?

Felicity Burch: That is a really important question. It is definitely the view of the business community that ARIA needs to be designed with the business community and the private sector in mind. When we think about some of the challenges that we are trying to solve in the UK, as well as the science superpower ambition and the goal of spending 2.4% of GDP on R&D, we will not hit any of those targets unless businesses are involved and engaged. The design of ARIA will be quite important to whether it will work for businesses or not.

The wording of the Bill is less important than the design and make-up of who is involved in ARIA and in thinking about what challenges the institution is trying to solve. Thinking about the individuals for a moment, we would very much like to see industry represented alongside the science base. Thinking about the design of it, we would be making sure that we do not focus too much on whether we are looking at basic or applied research or commercialisation, but flipping that on its head and thinking about what market problem we are trying to solve, who the end customer is, and then working back and thinking about who you need to engage along the way.

Q61 Chi Onwurah: Just to come back briefly, you have made an important point that echoes some of what we have heard already today. In terms of setting out a mission, or where ARIA should be looking, do you feel that more direction needs to come from Government or from public engagement, or should that be left more generally to the executives? As to ensuring private sector engagement, we echo the Government's ambition to reach 2.4% of GDP spend on R&D; indeed, Labour wants us to go from the average to the excellent, and reach 3%. The private sector is integral to that, so perhaps there could be a little more detail on how to ensure the new agency supports that ambition.

Felicity Burch: Definitely. It is great to hear an even bolder ambition for R&D investment. I am sure the majority of the business community would support that as well.

Thinking about the role that ARIA can play, particularly in the role of missions, what is really exciting about a mission, a problem statement or a challenge is that it not only does give an opportunity to bring together cross-sectoral players—we just heard about the role that AI and biotechnology can play when you combine them, and having a really clear mission helps to bring together those cross-sectoral players—but it also helps to advertise what you are doing.

One of the really exciting things for me about ARIA is that it is a big play—a big investment—that the UK is saying we are now making in science and innovation: “This is a change in the way that we are doing things, and this is the problem that we are trying to solve.” I do not think it matters, necessarily, if that problem is defined now or by the challenge director, but we need to think quite carefully about what the problem or challenge might be, and about some of the criteria that sit around that.

For me, there are probably two things that stand out as vital. The first is the sense of a market for a product at the end. One of the strengths of ARPA and DARPA in particular in the US is that customer relationship and an end customer saying, “This is the challenge that we need to solve, and probably we will buy it in the end if you do that really well.” The other thing that we want to think about is what challenges we need to solve as a society. What are the really thorny issues, where we know we need some game-changing steps forward in technology and where potentially Government can play a big role and have a big lever? A couple of areas that stand out in conversations with businesses are things like net zero and health, where clearly we have some big commitments that we want to reach as well.

Q62 Chi Onwurah: Thank you very much, those are excellent answers. I see that we have been joined by Professor Sir Jim McDonald, so before my next question I want to welcome all three witnesses and say how much we appreciate your joining us this afternoon.

For Adrian Smith and Professor Sir Jim McDonald: we have, very recently indeed, achieved some clarity on this year’s science budget. I know that that was a matter of concern for both the Royal Society and the Royal Academy of Engineering. There has certainly been a sense, and I wonder whether you would echo that sense, that we need long-term funding certainty—that it helps in the support of science and research more generally. Where do you see ARIA sitting in providing that long-term funding certainty, and how do you feel it can or should fit into the wider research environment? I will first ask Adrian Smith, please. It is nice to see you.

Adrian Smith: Thank you. Going back to the allusion to recent uncertainty about next year’s funding and where the Horizon Europe fee would come from, I stress that we need a coherent narrative and plan, not chopping and changing, and creating uncertainty. Uncertainty is bad, both within the community and for those who have to plan in the UK, but also for what we hope and assume will be our narrative of the UK being a global science and innovation player. Clarity of narrative and sticking to the plan is fundamental.

Where does ARIA fit? The starting point that most have accepted and signed up to is that having a new kid on the block in the high-risk and high-reward long-term space is welcome. Even though we have a plethora of agencies in the current ecosystem, there is nothing that sets out defines itself in that way. However, if this is to work, there are a number of things still to be clarified. I will mention a few, and Jim can pick up on this. ARIA has to have operational independence, if we are in the high-risk and long-term space, but it also has to have high focus. If we are aiming for £22 billion by 2024-25, £800 million is not a large sum of money, so if we have a plethora of missions, then I think we will go wrong. ARIA has to have focus of mission and a commitment to the model over the long-term, but also, and fundamentally, leadership.

This is an incredibly difficult agency, given the multiple stakeholders out there, and it will only work if it has the image and the street cred to attract and retain talent. I welcome the addition to the landscape. We need long-term commitment, but the recent experience of uncertainty about next year’s funding, the chopping and changing,

and the lack of clarity about Horizon, would not bode well for this. We need absolute clarity on the plan and how this is going to fit into that.

Q63 Chi Onwurah: Thank you very much. Professor Sir Jim McDonald?

Professor McDonald: Just to echo what Adrian has been saying, I welcome Felicity highlighting net zero and health. The additional funding is absolutely welcome. As you have pointed out, there was great concern about the uncertainty around the funding generally. The Government’s commitment to making the UK a science, engineering and innovation superpower is exciting. It is built on what is a genuinely world-class research base here in the UK, but of course traditionally we have not done the D in research and development terribly well, so ARIA coming forward to fit into the landscape is key.

To Adrian’s point on longevity, it would be good to get a planning horizon that was long—10 years de minimis and hopefully even longer, because many of the technological developments that come through these accelerated high-risk, high-reward programmes can take decades to come to fruition. Felicity mentioned the concept of a customer, and I could not agree more. The customer might be a Government Department but, for this acceleration of technology for solving challenges of scale at pace, we would increasingly need to see agencies, companies and industry sectors that can take these technological advances into practice. Late-stage R&D, which costs a lot of money, would be counter-productive. In fact, it would be even more damaging if we start the journey to have this innovation acceleration, this high-risk, high-reward agency, only to discard it within a few short years. I think that would damage business confidence, and we would also miss out on the opportunity to get the translational ability to feed out from the UK’s great research base to create new technologies.

Of course, there are a number of schemes that are suggested—Felicity touched on them—and there is the exciting legal commitment that the UK Government have made to net zero. There is an economy and opportunities to build around that. Healthtech, and the whole piece around global health and how we deal with that, is another great opportunity for the UK to mark out its capability.

ARIA should fit and integrate within the existing landscape. It should be a disruptive innovator, but it should not necessarily damage the existing system, much of which is working well, but there are gaps that ARIA can hopefully fill in the coming years.

Chi Onwurah: Can I follow up briefly with Adrian and Sir Jim? Thank you very much for your responses—
[*Interruption.*]

The Chair: Order. The sitting is now suspended. I shall resume the Chair at 4.9 pm. I apologise to the witnesses; it is how this place works. If you can just hang on, we will see you in 10 minutes.

4 pm

Sitting suspended for a Division in the House.

4.10 pm

On resuming—

The Chair: This session will now be slightly extended, for another 10 minutes. It should finish at 4.40 pm. We will start where we left off, with shadow Minister Onwurah.

Q64 Chi Onwurah: Thank you very much, Mrs Cummins. I shall endeavour to restart the exact sentence I was saying. It is noticeable that, while the Bill provides a minimum length of time for ARIA's existence of 10 years, there seems to be no provision for a minimum length of time for funding. Those research scientists who have recently lost their funding at very short notice because of cuts to the overseas development aid budget may not feel reassured by that.

I have three very specific questions. Adrian represents the Royal Society; Jim represents the Royal Academy of Engineering. We have had some discussion about whether ARIA should be looking at blue-skies research or transformational translation. I assume that you both think it should do both. Or maybe not—will you let us know?

Secondly, the Bill makes provision for public sector R&D funding to be spent by ARIA internationally. I understand that there might need to be collaboration—collaboration drives research—between UK and international bodies, but do you think it would be appropriate for ARIA to fund exclusively international research programmes?

Thirdly, do you think the UK should get some kind of tangible return from this level of investment in high-risk, high-reward research?

Adrian Smith: The answer is both, of course. If there were no research element, it would be something we completely understood and all that was left would be to deploy it, in which case this does not seem to be the right kind of agency to do it. I think it starts off with a substantial element of R, but that is perhaps pointless if it does not end up with the D.

Internationally, it is hard to think of anything really, at scale—even if it were only in terms of being a magnet for global talent of one sort or another, an international dimension is almost inevitable and appropriate, but if it were all offshored, that would make nonsense of the agency.

I have now forgotten what your third question was.

Chi Onwurah: Should the UK get a return on this investment?

Adrian Smith: High risk, high return is the mantra, isn't it? So I think an expectation of substantial transformational return is implicit.

Professor McDonald: First and foremost, ARIA should be a funding mechanism that delivers innovative solutions to ambitious, real-world challenges, bringing together and developing breakthrough research and technology. It is worthwhile reiterating that. Of course, that has to be driven by substantial funding. The flexibility—I am sure we will come back to this—the independence and autonomy for this agency are going to be fundamental to its success.

Adrian has mentioned skills a few times. I absolutely agree with that. While the fundamental research is not viewed as the primary focus of ARIA, it should be

keying into a rich base to draw from in the UK research base. Of course, there is an opportunity here for international collaboration as we drive development towards application. However, it is not unreasonable to imagine that ARIA could commission basic research work that emerged as it sought to solve some of these major challenges.

The international connectivity is important, even at the highest level. Telling the world about our ambitions around being a science superpower and trying to become one of the world's most innovative nations is not something that we should keep to ourselves. We should be promoting that, showing confidence in the UK that we are building on our outstanding research base but we now have another mechanism through which we can drive technologies, find solutions and indeed build economies. So I echo Adrian's point: this could be a great magnet for talent into the UK and those excellent international individuals who want to come here, some of them pursuing research but many of them also engaging in that exploitation, in that high-risk, high-reward programme. So I would encourage international connectivity, but, speaking as an engineer, I would like to see good outcomes that impact on the economy positively, build industry, support the creation of supply chains, support indigenous supply chains and create new ones around new technologies, whether in net zero, health tech or AI, to build an industry through which we can drive the economy to keep that virtuous circle of driving economic strength so that we continue to invest in science, research and innovation. There is a circularity here, and I would suggest that we do not fragment and see these things in a systems perspective—that is what engineers will propose in any case—but see ARIA as part of a larger system. But driving that through to economic and societal benefits is key for me.

Chi Onwurah: Thank you very much for your answers.

Q65 Amanda Solloway: Welcome to the witnesses—it is lovely to see you this afternoon. I have two questions that are relevant to all three of you, please. Given that we know how important ARIA is to the UK economy, what importance do you put on patience when we think about funding high-risk transformational research? How necessary is it that we have a long-term view?

Felicity Burch: As I know you are aware, I think having a long-term approach to funding R&D matters hugely. From the perspective of the business community, having institutions that are in it for the long run that they know they can come back to and that they are aware exist is really important for their own confidence to invest.

Thinking about the agency slightly more specifically, when it comes to its own patience, one of the things that CBI members have highlighted to me as a particular benefit of the DARPA model is the commitment to funding their programmes for significant periods of time. For example, there might be 10-year funding with three-year gates to check if the project is working. Those commitments, with that 10-year view—so long as everything is going more or less according to plan—is hugely important for bringing business funding alongside that. So if we can bake a long-term view and patience into ARIA from the start, it will certainly help it to be successful.

Amanda Solloway: Thank you, Sir Jim?

Professor McDonald: It is nice to see you, Minister. There is a requirement here to have a significant cultural change—that is embedded in your question—to move away from the value-for-money concept that is deeply embedded in the UK Research and Innovation funding structure. That is important, but of course we would need to innovate the funding model, which is what is being sought here. Value-for-money assessments for disruptive innovation may not be assessed, as you indicated, until decades later, so we will need a longer-term outlook or alternative approaches to assessing value, such as a means of building capability and capacity in both technology and skills.

Of course, projects that were deemed unsuccessful in achieving their goal may produce value in terms of people, skills and lessons learned, so we must take a long-term view. I think we see that notion of patience, but it is about the ability to have that highly driven, focused approach that the executive officers and the board of ARIA will take and—we may come on to this—the ability to fail fast and elegantly and not be punished for failure as long as the process has been driven openly, transparently and with excellence underneath it.

I would say, absolutely long-term vision and drive forward. If everything worked and everything was successful, we should challenge ourselves and think maybe the questions were not quite as challenging as we thought they might be. Failure is not something we should be discouraging—it is about risk and collaborative approaches to driving problems to a solution—but long-term vision is absolutely essential. That is why, as you have heard from Adrian and Felicity, that patience and that long-term view is key. It should become a very natural part of the UK landscape, so that it is something that we boast about and that acts as an attractor for business and investment, and to attract and retain talent.

Adrian Smith: Let me echo everything that Jim said. The scale of mission that we would hope to see from such an agency means that the timescales will be long and we will need to build new research capability over those timescales, in so far as we are interacting with technologies, and perhaps new supply chains. If those are to come out of the woodwork, they need to believe that we are in it for the long term and that there is patience on the part of the funders and others. The timescales are really important, not just in terms of if it is a hard problem, it will take a long term to solve; if it is a hard problem, we will need to build all sorts of new capabilities and capacities. To have the courage to invest in those, we need to know we are in it for the long term.

Q66 Amanda Solloway: Thank you. Sticking with you, Sir Adrian, I was thinking that we have heard an awful lot about the importance of ARIA recruiting people from a variety of backgrounds. I wonder how we attract the best people, from industry in particular.

Adrian Smith: Is that a question for me? It is probably a better question for Felicity. Going back to the earlier comments, a fundamental is to trust long-term commitment from the Government that we are really in this, and we have a plan with clear funding milestones and we will stick to that plan. That is what will give the international community the message that we are in it to be really serious. That serves two purposes: for the narrative of

the UK, and as an attractor for brilliant people, whether they are in research or industry around the world, to come and join in this long-term challenge.

Professor McDonald: How do we attract them? The scale of the ambition will be a major attractor to someone, with that executive excitement and experience that they will bring. Large-scale ambition and, as we said earlier, a commitment to the long term to making this work for the UK, in that it is a long-term integrated approach. I suggest that the CEO would have to have experience beyond academia; preferably, as you have suggested, Minister, including industrial experience—that ability to take the journey from concept through to proof of concept, demonstration at scale and deployment. Ultimately, commercial exploitation is key.

I can assure you that the engineering community will be well engaged with this as we help to bring forward individuals of the right stature. Industry expertise and understanding should be a prerequisite for ARIA personnel. An interesting example, which many of our colleagues in the Committee will be familiar with, is the vaccine taskforce: bringing together industrial expertise—traditionally competitive companies large and small within their supply chain—with Government officials and the National Institute for Health Research. That was a fantastic microcosm of large-scale, high-risk and ultimately high-reward outcomes. In many ways, that gives us a precursor for some of the approaches and cultural changes that would be needed to take that forward. For the chief executive or chair of the board, it would be great to have industry-relevant background, a commitment to innovation and excitement about the scale and potential impact of the work that they are taking on.

Felicity Burch: I listened to a number of the earlier sessions, and I was delighted to hear about the focus from so many stakeholders on the need to build a diverse team within ARIA, but also thinking about the diversity of the community that we engage in it. One of my reflections is that we are trying to build something that looks a bit like US DARPA, but we are 60-plus years on now, and the international, national and social picture is completely different. We have an opportunity to build something that really excites, for the next generation of researchers and business people.

If you look at businesses that are trying to achieve those same goals and the practices they put in place to try to recruit brilliant people, you will see that, first and foremost, purpose really matters. Clearly defining the mission of what ARIA is trying to achieve when we get the team in place, making sure that it is something that excites people, having a clear market, and also solving national and international social problems will help encourage really bright, brilliant people to get involved.

Secondly, it starts with the senior team. We are building this team from scratch, and we need to make sure when the team is being recruited that it is diverse in the broadest sense possible—that we see women, ethnic minorities, and those with disabilities represented on the senior team for ARIA to really send a signal that the way we want to innovate in the UK is diverse and that we want to make the most of all our talents around the country.

Q67 Aaron Bell: I thank all three of you for your time today. I have one brief question for Ms Burch and then one for Sir Adrian. In terms of the funding ideas and

[Aaron Bell]

streams available through ARIA, would the CBI and your members welcome the potential of investments in companies or joint ventures with ARIA?

Felicity Burch: One of the really exciting opportunities from ARIA is the potential for joint ventures and engagement. Essentially, my answer here is pretty short. Go ahead and do it, but make sure you engage with business communities a bit further down the line in exactly the design of how those funding mechanisms might work. Different businesses at different stages of their journey will be interested in different funding mechanisms.

Q68 Aaron Bell: Thank you. Sir Adrian, speaking to your professional interest and expertise as a Bayesian statistician, which I share as a layman, how can we use Bayesian statistics to help decide which projects to fund and also when to pull the plug?

Adrian Smith: I was not expecting that question. The problem with the kind of mission that we would like to see in ARIA is probably that there are very few precedents. So where we are going to get our prior information from to deploy my wonderful Bayesian analysis, I am not quite sure. Let me use that to point out something else. It will be very interesting to see how we creep up on a mission and why ARIA would be appropriate for that mission. There are two things that you will all know about and I am involved in. I am on the board of the UK Atomic Energy Authority, and fusion, you could say, is the ultimate mission of all time. The mechanism there is with an authority and long-term Government funding in a different model. Solving the problem of batteries you could say would be an absolute fundamental mission, but there we have set up the Faraday Institution. I suppose the question as we go along is: what makes ARIA the right kind of place for what mission, given that we have lots of missions and lots of other ways of trying to solve them?

Aaron Bell: Perhaps we need someone with particular expertise in portfolio management as well, because it seems the risk/reward of these missions is so key. I will leave it there.

Q69 Stephen Metcalfe: Good afternoon, all. I have a quick question for Felicity. We heard earlier from Dr Highnam from DARPA about the high level of churn among the project managers and that they move between academia, business and, in their case, DARPA and that creates the right culture. Presumably it requires flexibility from the businesses themselves. Do you see your members embracing that kind of secondment into a research body such as ARIA, even though it may not lead to anything?

Felicity Burch: I have not talked to them directly about this in the context of ARIA, but I can reflect on conversations about business and university collaboration more generally. I think our members do see value in seconding people to research teams to learn new skillsets. Likewise, we would love to see more people from university sectors being seconded into businesses. Were there a world-leading agency like ARIA, being able to say, "My people have worked on one of these teams" would be quite a prestigious thing for businesses. I guess the

flipside of that is this: how do we make sure that we build ARIA to be that prestigious body that businesses feel comfortable seconding their people to?

I think that time and again we hear businesses saying that that fluidity of people between the business sector, the university sector and the research sector more generally is really important for successful innovation and building an ecosystem. I am sure that if any business pointed to any one individual, they might not want to lose them, but I think this is much more about how we build a really flexible and really brilliant innovation ecosystem, and to that extent I think that businesses would be really happy to see those moves.

Q70 Stephen Metcalfe: Have you any advice on how we should approach building such an organisation?

Felicity Burch: In the sense that it would encourage businesses to second people on to ARIA?

Stephen Metcalfe: Yes. You said that we have to build an ARIA that encourages that kind of collaboration. What is your advice about doing that? Where are the risks and rewards from an employer's point of view?

Felicity Burch: One of the challenges is making sure that ARIA has its own clear purpose, so that businesses know why they would second people to it. The truth is that we have a lot of other institutions in the research/innovation landscape, as we have already referred to throughout this conversation, and as you have heard from the previous panels today. However, once ARIA is up and running, has a clear mission, and has some really great people on it who you can point to as being leaders in their field and really pushing the boundaries—when you can tell a clear story about what the organisation is set up to do—it will become a lot easier for a business to make the case that, "Yes, it makes sense for me to put a person on there; they are really aligned to what I am doing," or not.

Q71 Daniel Zeichner: A few years ago, we were told that there was no magic money tree. That seems to have been parked temporarily, but I fear that it will return at some point. I detect enthusiasm from all of you for this project, but how much is your enthusiasm dependent upon the money being genuinely new and additional in terms of the wider research environment?

I have a second question. Through the day, we have heard from different witnesses mainly a view that there needs to be a mission but also some difference of opinion as to who should set that mission. Who do you think should be setting it? Maybe I can go to Sir Adrian first.

Adrian Smith: In terms of new money or old money, I think the key thing is really to look at the big picture. The aspiration—the 2.4% aspiration—is aiming at the average of the OECD, which has probably crept up now in any case to 2.5%. In the meantime, the United States is around 3% and Israel is around 4.7%. The big picture stuff is the total amount of investment in the R&D landscape. So I think there would be less warm support for this body if it were at the expense of that wider investment.

As for who sets the mission, I think it is an extremely interesting question. There is an interesting tension between what most of us would see, which is that if this

agency is to have real street cred, it needs tremendous operational independence, but on the other hand the thinking behind it is that the mission will be of great benefit to the UK. Clearly, therefore, Government and a multitude of stakeholders have an interest in what the mission will be, and how the leadership of the new organisation will satisfy the desire on the part of all those stakeholders to have a finger in the pie of influencing the mission. I think that will be very interesting to see.

Q72 Daniel Zeichner: That sounds like a gloriously British response to me, but I agree with it. Felicity?

Felicity Burch: Similarly to Adrian's response, support for this body comes alongside the fact that it is new money, and we need the new money in order to grow the level of R&D in the UK. The level of Government spending on today's level—obviously, there are longer-term plans, but at today's level—would not hit the target. I think we do need new money in the system, and it makes sense that ARIA is one of the places to which that money is directed. But we do not want to undermine other institutions, such as UKRI and Innovate UK, and catapults in particular are hugely important to businesses. We do not want to undermine that, and this is definitely about building up a coherent system.

One other thing to note is that we have tried to create something that looks like ARIA quite a few times before. For a long time, there has been a sense that we needed to do something like this. Initially, when what was the Technology Strategy Board was founded, people talked about it looking like a UK version of ARPA. When we established the industrial strategy challenge funds, people also talked about them being a UK version of ARPA. The difference with ARIA is the legislative approach and the creation of an independent body, which means we are genuinely doing something different. This is a really exciting way to leverage some of the Government's R&D investment. As to who precisely sets the mission, I understand that BEIS would like the ARIA team to do that. There is a lot of sense in that, but they cannot do that in a vacuum; it needs to make sense to a wider science innovation community, and to society in fact. That comes back to the importance of a long-term market and the social issue that we might want to address with ARIA. We will be looking out for it to do those things.

Daniel Zeichner: Sir Jim?

Professor McDonald: Thank you. Coming back directly to the question, this must be new money to enhance the credibility of what is sought to be done. As you know, we said earlier that the UK's research, science and innovation base is an absolute national asset. We cannot exploit that research base if it is underfunded and not attracting the very best talent with the very best facilities. This has to be additional investment to complement existing funding.

I agree with some of the implicit elements of your question that that investment must sit within the system perspective, so although this will be a new funding model that brings a new type of leadership into the research and innovation landscape, there must be plenty of dialogue between ARIA leadership and UKRI, BEIS and other entities that Adrian mentioned. There might be some competition, which would be healthy, but there

may be some articulation in complementarity that will emerge if we are doing the right things. It needs new money and long-term commitment.

As to who should lead this, I buy into the model of greater independence and autonomy. The customer will exert influence; to go back to the comment about the customer being a Government Department or Departments, and industry as well, they will have an influence and try to prioritise where the CEO and the team and board will take the direction of travel for ARIA. I would like to see it exercise independence and autonomy going forward.

This may have been raised earlier, but I think public communication will be critically important. Let us have the public understand why this is important, and give a voice to the science, engineering and innovation community. They should be accountable for ensuring that the idea is understood by the nation. I am not suggesting that the public would be directly involved in the agenda, but that public engagement would raise awareness of what science innovation is all about and turn some of the Government's superpower commitments into a reality for individuals out there in society.

New money, please, and a long-term commitment, and let us give this entity independence and autonomy but the accountability that sits behind it should respond to our customers' drive for new technological solutions. That should be done in a way that drives value into the UK economy.

The Chair: Thank you. We will have a very quick sneaky question from the shadow Minister, Chi Onwurah.

Q73 Chi Onwurah: Thank you very much. Adrian, I was very interested in what you said about the number of people in organisations who want to influence the terms of the mission. Obviously, if the Government set the mission, they have a democratic mandate. If the CEO or the director sets the mission, how would you suggest that we can test that he or she is not simply being influenced by their pet projects and preferences? What kind of test could we set out?

Adrian Smith: Whoever is chosen to be the chief executive and whoever surrounds that person in governance must be people the rest of us will trust. They will have the stature to be trusted. Without that, I think we are in trouble.

Q74 Chi Onwurah: So you think it is only trust, and there has to be trust in governance?

Adrian Smith: I think it is an essential element. As I said earlier, I think genuinely that whoever is going to lead this and oversee the governance has to think very hard about how you interact with both the hard-nosed stakeholders and, as Jim and others have alluded to, the public, in terms of taking them along with the idea that this is a mission that is ultimately for the good of all of us.

Chi Onwurah: Thank you.

The Chair: Thank you very much. If there are no further questions from Members, then we are dead on time. May I thank the witnesses for their evidence before we move on to the next panel? Thank you very much.

Examination of Witnesses

David Cleevly and Bob Sorrell gave evidence.

4.40 pm

Q75 The Chair: We will now hear oral evidence from David Cleevly CBE, chair of Focal Point Positioning Ltd and the Cambridge Science Centre, and Dr Bob Sorrell, chair of the Campaign for Science and Engineering. We have half an hour for discussion. Could the witnesses please introduce themselves? Thank you very much; it is lovely to see you both.

David Cleevly: I am David Cleevly. I am a serial entrepreneur with a background in telecoms and biotech. I have done a lot of work on Government policy, been a board member of the Ministry of Defence and founded networking organisations, including the Centre for Science and Policy at the University of Cambridge. I am glad to see that Bob, who helped me get that off the ground in the early days, is on the panel with me. I am currently chair of the Enterprise Committee at the Royal Academy of Engineering and, for my sins, I am chair of the Cambridge Autonomous Metro Technical Advisory Committee.

Bob Sorrell: Good afternoon and thank you for inviting me to the Committee. My name is Bob Sorrell. I am the chair of the Campaign for Science and Engineering, which is the UK's leading independent advocate for science and engineering. I come into that with quite a lot of experience in research and development, and I also served two terms on the board of Innovate UK, as well as being a non-executive director in a start-up company, so I have a variety of experience.

The Chair: Thank you very much. I will start the questions with Chi Onwurah, the shadow Minister for the Opposition.

Q76 Chi Onwurah: Hi, David and Bob. It is great to see you both and thanks for giving your time. I do not know whether you have been able to follow our evidence sessions, but we have had a lot of discussion about the purpose and remit of ARIA and the extent to which it addresses fundamental failings—if there are fundamental failings—in how the UK chooses and commercialises research. I would like to ask you both your opinion on the remit and purpose of ARIA. What is the failing that you see ARIA fixing? How does it need to change to fix that? Are there things that it is not addressing that it needs to? I will start with David Cleevly.

David Cleevly: Thanks, Chi. I would like to start by saying three things rather briefly. First, serendipity does not happen by accident, so we need systems and processes to enable the network diversity and uncovering the unexpected. I am hoping that the new agency will do all of that.

To begin to address some of your other points, we need to improve the whole of the national innovation system. That means not putting in late stage R&D, translation and, in particular—this is something of a bugbear of mine—procurement. If you do not have revenue and if you cannot get product into market, no amount of R&D at the front end will necessarily get you anywhere. If we do not do that, we are always going to be trapped into saying that we need more and more R&D and simultaneously mourning our inability to translate this into economic growth and productivity.

I have one other thing to say, which is slightly cheeky, but I have been listening to the proceedings so far, and they are extremely interesting—it is one of the most interesting sessions I have ever attended. All the examples given of contributions that make a difference have all been, it strikes me, about engineering, so I suggest that we rename this the “Advanced Research and Engineering Agency”. To be honest, “invention” strikes me a bit like something in the 1950s, with somebody emerging from a shed with a gadget that has just blown their hair off. Peter Highnam pointed out “projects”, so we might actually consider it to be the “Advanced Research and Engineering Projects Agency”. No doubt we will get on to why I might say that. The point is that we need to think about this, as Felicity said, in a coherent way, including all the way through to procurement.

Q77 Chi Onwurah: As a chartered engineer, I am always happy to put engineering in anything. The Advanced Research and Engineering Projects Agency would be AREPA. Your point, which has come up a number of times, is whether this is about, if you like, cutting-edge research, or whether it needs to be looking at transformational translation of existing research, or whether it needs to do both. Certainly, the economist Mariana Mazzucato, as you probably heard, made the point that having the basis there is important, and you seem also to be saying that it needs to look at both, and that it needs to get its purpose right. Let me go now to Bob, and then we will come back.

Bob Sorrell: Thank you very much. Picking up on David's comments and your question, I am very excited about the potential creation of ARIA. Having something that can respond to the types of challenge that we face, which quite frankly do not respect sector or skills boundaries, is really important today. In particular, there are real opportunities to learn off the back of the covid experience, which has allowed us to really accelerate innovation at quite an incredible pace. If we can take some of that and operationalise that within an ARIA-type environment, that would be a very positive thing.

One thing I have heard, because I have also been listening to the sessions through the day, is mention of crossing the valley of death. For me, there needs to be a matching market pull for the wonderful research products that will come out of ARIA. To get that in place would mean having a really good dialogue between academia and industry and all parties involved to understand what those challenges really are. I also suggest, looking at the DARPA model, that we should back this up by having a really strong public procurement model. Again, we have seen that in covid, and we could see it here, providing a first customer and enabling some of these technologies to be developed. That would be really key.

The final thing I will say is about the personnel involved in this, because that has also come up several times. They really need to have autonomy; they need the ability to make the decisions and choices on what projects they pursue. Equally, they need to be able to start and, critically, stop things. I have much more to say, but I will stop there.

Q78 Chi Onwurah: Thank you for both of those responses. To follow up, you both emphasised the importance of procurement and market pull. It seems to me that there is such a vast range of areas, issues or

challenges that ARIA could look at. What are your views on who should decide what it looks at? Is there a need for a mission, and who should that be set by? If it is left to four, five or six individuals to set the missions, how do we ensure that it is not simply about vanity or pet projects, and that cronyism—we are having some challenges with that at the moment—is not promoted? How do we avoid cronyism and support diversity?

David Cleevly: I notice that this came up in the previous session. I think the answer is, in one sense, very straightforward. I think it is for the Government to set the priorities where they feel that there are specific challenges. We have talked about climate change, for example. That is one, and there may be others that one would want to address, either in health or in other topics. That is the point at which the handover occurs and whoever is running ARIA takes that particular domain or challenge. I have been involved, for example, in the Longitude prizegiving, and it was very interesting how we focused down on antimicrobial resistance and testing. A lot of interesting things came out of that. By the way, all the solutions were engineering.

The point is that we should listen to Peter Highnam's testimony really carefully. Honestly, that was one of the most interesting insights into DARPA that I have had. He talked about the way in which there is autonomy within DARPA to do things within a general area set by Government. Then, within that, there is a peer-review system that enables us to overcome some of the cronyism that you talk about. The more open you are about what you are doing, the less easy it is to hide the fact that you have let particular contracts and so on, so there ought to be a mechanism within the governance structure of the agency to do that.

There is a two-level thing here, but it is up to the Government to decide where the UK's priorities are. Are we, for example, really concerned about climate change? Can we specify challenges within climate change that will make a difference? In the same way, for defence it was to not be surprised by innovation and to make sure the technology was available for defence in the United States. Within that, DARPA went ahead and looked for things that met that overall goal.

Bob Sorrell: I think there needs to be an overarching structure set for the areas ARIA pursues. In identifying these grand challenges, there is a list that we could reel off right now that would fit the scope. Earlier, I heard conversations about having six wise people who would make these decisions and cover these areas. I worry about that approach. I think you need people who are really up for engaging people to understand the nature of the problems and translating them into meaningful challenges.

The other part that is often missed in this is the social science aspect, because there has to be a level of public acceptance around the things that people are developing on their so-called behalf, and that part is also incredibly important. We need to have a very open process for how we decide on those projects so that we avoid, as you say, falling into the traps of vanity or pet projects. If you have clear criteria from the outset and stick to them, you will be fine in that regard.

Chi Onwurah: Thank you. I could ask you lots more questions, but I will stop there and hand over.

The Chair: The next set of questions is from Minister Solloway.

Q79 Amanda Solloway: It is lovely to see our two witnesses this afternoon. The first question is to Bob. You mentioned in your written evidence to the Science and Technology Committee that a body like ARIA will need an understanding of failure. What does a new understanding of failure look like, exactly?

Bob Sorrell: That is a great question. If you compare and contrast us with the Americans, there is a definite culture in the UK that failure is something that you hide under the carpet, put away and forget, but science is all about failure and pushing the boundaries. If you are not failing, you are really not challenging those boundaries. I think it is about establishing a culture in which we can accept failure and move on.

The problem comes, in both industrial and academic environments, in facing that day, because there is a tendency to keep things creeping along because you have invested so much effort to get them to this particular point. You do not want to kill it, because then you have to stop the project, and people feel emotionally involved in it. That creates a whole series of issues associated with it. It is about making the hard decisions and learning from failures. We describe them as failures, but actually they are some of the most valuable learning experiences that we gain, and they stop us reinvesting in making the same mistakes in the same areas if we are really careful about what we extract from them, and do not just try to shut them off in a box, in a rather embarrassed way, and say, "That's something that we will leave to one side."

Q80 Amanda Solloway: Thank you very much for that. I have a more general question to both of you. One of the things we have heard a lot about today is the importance of fitting ARIA into a larger innovation system. What advice do you both have about how ARIA can forge the most productive relationships with a range of public and private sectors, for example?

David Cleevly: As well you know, I am very keen on establishing networks of individuals and making sure there is lots of exchange. Part of the essence of putting an agency like this together is to ensure that you get a lot of cross-fertilisation. There should be a great deal of exchange going with that, and you would, of course, have to have in place the conflict of interest and various other peer-review processes.

It is very important that an agency like this would work closely with the private sector. My first encounter with DARPA goes back to 1977. At that point, I was working for Post Office Telecommunications, which shows how long ago it was. We were discussing the idea of funding this funny thing where you cut information up into packets. A lot of the collaboration that was done on all of that involved a great deal of what was then a monopoly, though a commercial entity, helping to fund those things. That kind of stuff is extremely important and needs to be built into the processes by which this agency operates.

Can I just pick up on the notion of failure? There are two kinds of failure. There is the kind of failure that we have seen with SpaceX, where you send a rocket up and you land it and it crashes or burns up after about 12 minutes because it is leaking fuel. That is one kind of failure. Quite honestly, the private sector got involved in replacing NASA because NASA became too cautious about dealing with that kind of thing.

There is another kind of failure where you have picked the wrong technology—the wrong way of approaching a problem. I think we are talking about the second kind, and about recognising how to stop that. That is a peer-review process; that is a way of making sure you do things. What we need to avoid is reacting to failure where the rocket is crashing on touchdown. That is not really failure; that is simply experimentation.

Q81 Amanda Solloway: Thank you, David. Bob, any further thoughts on the relationship and how to engage with public and private sector?

Bob Sorrell: I would say three quick things. First, ensure that there is a real partnership between industry, Government and academia, in actually shaping the agenda for ARIA. I would have flexibility; we heard that earlier, I think, from a colleague from the CBI talking about models in which we could second people into the ARIA organisation. I think there is an opportunity to do that, and we have had experience of doing that previously.

The other thing is that ARIA provides some really important learnings, and it should be able to integrate those back into UKRI, and vice versa. UKRI has some valuable learnings that it can impart to ARIA. This is an evolutionary process through which both parties will definitely benefit, and it should be framed in that light.

The Chair: Thank you, Minister. Daniel Zeichner.

Q82 Daniel Zeichner: Thank you, Chair. Welcome, both of you; it is good to see you. I have been struck throughout today by the evidence that we have been looking at an American model, trying to learn lessons from it and importing it into what looks to me like a rather different environment and landscape here. I would like both of you to ignore all that we have heard today and answer the question I would ask at the beginning, which is: what is the big problem facing the UK R&D system? Do you think ARIA, as it is presented, can be bent to fit whatever problem it is that you think needs to be solved?

David Cleevly: What is the big problem? The big problem is that we do not have procurement systems that buy enough stuff from small and medium-sized enterprises. Half the employment growth in this country comes from 7% of the SMEs that are fast growing. If you look at a place like Cambridge, as you well know, Daniel, we have 20 \$1 billion companies. Companies that have come into existence that were not even a glimmer in somebody's eye in 2014 and are now about to be floated.

That is the kind of process we need to understand, and why we do not have more of those successes. In particular, if I may blow Cambridge's trumpet, we need to understand why we have those things happening in Cambridge, and why they are not being replicated elsewhere. From my personal point of view, having sold a company to an American buyer last November, which, as you can imagine, was an interesting experience, it was because it had innovative technology. We were absolutely the best in the world and hardly anybody from the UK bought anything from us. The majority was being bought by Americans—American defence and security stuff.

It is a great disappointment to me that we do not have the ability to nurture and bring on. The way the Americans do it is that they have that complete system. They have an awful lot of money and effort going into procurement.

Somebody spoke earlier about the infantilisation of Government Departments, and the way in which that expertise is not there. I will mention engineering again here. We need more engineers in Government, who can take those kinds of decisions and understand what we need to procure to be able to do things. That strikes me as so important. It is not to detract from AREPA, as we might call it, but in order for it to be as functional and effective as possible, we need to look at the entire system.

Bob Sorrell: That was a great answer from David. I will just pick up on a couple of things. I go back to the fundamental issue of matching the research that is coming out of ARIA with the market pull for it. It is important to define what the challenges are up front. The role of public procurement, as David raised, is critical, as is supporting the growth of the so-called *Mittelstand*—the mid-sized companies—and understanding what is behind the culture that leads to so many of those companies being sold at around the £50 million level, as opposed to growing to the hundreds-of-millions-of-pounds companies that they could be. How do we support them through that whole growth cycle? There is much more that I think we could do in that space.

Q83 Daniel Zeichner: To summarise slightly—I do not want to become a grim AREPA—what we need is not only an ARIA that can do the things that we have been talking about today, but possibly other things alongside it to make it work. Would you agree with that?

David Cleevly: It is fine tinkering around with the engine and putting another turbocharger on it, but if the chassis, the transmission system and the wheels will not deliver what you need, all that energy and power is going to go somewhere. In an international system, all we will do is to help to accelerate other countries that are willing to buy our stuff from us. That is fine; I am all for international co-operation, but I really would like to see a bigger contribution to economic growth and productivity improvements in the UK.

Bob Sorrell: To pick up on what David is saying, ARIA is part of the solution. We need all the things that we have, effectively, to put us in a position to lead against the challenges that we face. We would not be in this position if we did not have such a brilliant research community in the UK to start with. It is fantastic that we are having a conversation about how we capitalise on that. It is not just £800 million for ARIA, which is just seed money to start it, but the investment in the overall infrastructure that will make many of these things possible. We need to commit to doing that as well, if the UK is really going to lead and be the test bed and demonstration centre for the technologies that it can lead in and deploy globally.

David Cleevly: I think Bob and I are absolutely in agreement on that.

Q84 Chi Onwurah: If nobody else has a question, I will take the opportunity to come back on that point, particularly on procurement. I remember having a great deal of difficulty persuading the Prime Minister that the American Department of Defence was far better at buying stuff from UK small businesses than the UK Ministry of Defence, as the figures show. What do you think we could do, or what should Government be doing, to enable, require or ensure that ARIA, or AREPA, better supports small business growth and, at the same time, addresses the issue of market pull?

David Cleevely: The general thrust of what AREPA—if we are going to adopt that word—is trying to do is right. There are a number of things going on in bits of defence, for example. You have DASA and various others playing around with projects within the different services, for acquiring different kinds of technology. I think the phrase “a bit more coherence” was used by Felicity. I think we need to understand what the map of that innovation system looks like.

I am pretty convinced that people are pretty smart—they will make the right decisions. You just need to give them the right structure, hence my point that serendipity does not happen by accident. These kinds of things happen because you have constructed systems and processes so that people bump into and talk to each other, and will exchange ideas. ARIA is fine as it stands, but it sits within quite a complex system. I would like to see much more recognition within Government about how complex that system is, and how it actually operates. I completely agree with you that it has been far easier, in all my companies, to sell stuff into the United States—particularly into the United States defence market—than it has ever been to sell into the UK.

Bob Sorrell: To build on that, I did a couple of terms at Innovate UK and we tried stimulating public procurement during that period. I think a lot of it is about the culture and getting it right, to allow people to invest in those smaller companies and different technical solutions, to move them away from the existing ones. We got that to work during covid. We managed to get it to work, and we managed to get ourselves investing and procuring things in a different way. That is why I keep coming back to that and looking at what we did differently then that allowed people to make those different choices. I think we have to take some of that learning to see how we can get public procurement to work in a better way going forward.

The Chair: We have one last very quick question from Sarah Owen.

Q85 Sarah Owen: Bob, you mentioned engagement and trust. We have heard a lot today about accountability and trust. How do you feel that we can get that trust without stifling innovation, and do you think FOIs are the best way to do that?

Bob Sorrell: If you are to get trust, you need to be transparent about the choices that you are making and how you are making them. Then, when you move to the execution phase, you need to allow the programme managers and the people who are driving the programme scenario to make the choices flexibly and in the quickest way possible. I understand in part what you are perhaps playing into, but I think you just need to strike the right balance between transparency on how choices are made and holding to account on that, and allowing people to get on with executing against those programmes once those choices have been made.

David Cleevely: I think the acid test is whether you can explain something to someone who is independent and is one of your peers. If you are happy explaining it back to somebody like that, that is fine. That is the way in which the system works. If you listened to Peter Highnam talk about how DARPA was organised, that was built into the DNA.

Q86 Sarah Owen: Do you think it would be useful to have that built into ARIA from its inception?

David Cleevely: I think it is essential. I would be very uncomfortable if you had an agency that did not have some degree of—accountability is not exactly the way to describe it, but you have to have a group of independent people reviewing what you are doing, not quite in the same way as you would do an audit, but it is basically that kind of principle. If I have to explain something, as I am having to do for this Committee, it is a lot clearer and more straightforward, and I feel a lot more comfortable about the way in which I can rely on the ideas and what I am doing. I think that process is very, very important.

The Chair: If there are no further questions from Members, I thank the witnesses for their evidence. The Committee will meet again on Tuesday at 9.25 am to begin line-by-line consideration of the Bill.

Ordered, That further consideration be now adjourned.
—(Michael Tomlinson.)

5.10 pm

Adjourned till Tuesday 20 April at twenty-five minutes past Nine o'clock.

PARLIAMENTARY DEBATES

HOUSE OF COMMONS
OFFICIAL REPORT
GENERAL COMMITTEES

Public Bill Committee

ADVANCED RESEARCH AND INVENTION AGENCY BILL

Third Sitting

Tuesday 20 April 2021

(Morning)

CONTENTS

CLAUSE 1 agreed to.

SCHEDULE 1 under consideration when the Committee adjourned till this day at Two o'clock.

No proofs can be supplied. Corrections that Members suggest for the final version of the report should be clearly marked in a copy of the report—not telephoned—and must be received in the Editor's Room, House of Commons,

not later than

Saturday 24 April 2021

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The Committee consisted of the following Members:

Chairs: JUDITH CUMMINS, MR PHILIP HOLLOBONE, †ESTHER McVEY, DEREK TWIGG

- | | |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| † Baker, Duncan (<i>North Norfolk</i>) (Con) | † Onwurah, Chi (<i>Newcastle upon Tyne Central</i>) (Lab) |
| † Bell, Aaron (<i>Newcastle-under-Lyme</i>) (Con) | Owen, Sarah (<i>Luton North</i>) (Lab) |
| † Blackman, Kirsty (<i>Aberdeen North</i>) (SNP) | Richardson, Angela (<i>Guildford</i>) (Con) |
| † Butler, Dawn (<i>Brent Central</i>) (Lab) | † Solloway, Amanda (<i>Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy</i>) |
| † Crosbie, Virginia (<i>Ynys Môn</i>) (Con) | † Tomlinson, Michael (<i>Lord Commissioner of Her Majesty's Treasury</i>) |
| † Fletcher, Mark (<i>Bolsover</i>) (Con) | † Zeichner, Daniel (<i>Cambridge</i>) (Lab) |
| † Flynn, Stephen (<i>Aberdeen South</i>) (SNP) | |
| † Furniss, Gill (<i>Sheffield, Brightside and Hillsborough</i>) (Lab) | |
| † Hunt, Jane (<i>Loughborough</i>) (Con) | Sarah Ioannou, Seb Newman, <i>Committee Clerks</i> |
| † Mayhew, Jerome (<i>Broadland</i>) (Con) | |
| † Metcalfe, Stephen (<i>South Basildon and East Thurrock</i>) (Con) | † attended the Committee |

Public Bill Committee

Tuesday 20 April 2021

(Morning)

[ESTHER McVEY *in the Chair*]

Advanced Research and Invention Agency Bill

9.25 am

The Chair: We are now sitting in public and the proceedings are being broadcast. Before we begin, I have a few preliminary announcements. Members will understand the need to respect social distancing guidance. In line with the Commission's decisions, face coverings should be worn in Committee unless Members are speaking or medically exempt. *Hansard* colleagues would be grateful if Members could email their speaking notes to hansardnotes@parliament.uk. Please switch electronic devices to silent; teas and coffees are not allowed during sittings.

We now begin line-by-line consideration of the Bill. The selection list for today's sitting is available in the room and shows how the selected amendments have been grouped together for debate. Amendments grouped together are generally on the same or similar issues. Please note that decisions on amendments do not take place in the order in which they are debated but in the order that they appear on the amendment paper. The selection list shows the order of debates. Decisions on each amendment are taken when we come to the clause to which the amendment relates. A Member who has put their name to the leading amendment in a group is called first; other Members are then free to catch my eye to speak to all or any of the amendments within that group. A Member may speak more than once in a single debate.

At the end of the debate on a group of amendments, or new clauses and schedules, I shall again call the Member who moved the leading amendment or new clause. Before they sit down, they will need to indicate whether they wish to withdraw the amendment or new clause, or seek a decision. If any Member wishes to press to a vote any other amendment in a group, including grouped new clauses and schedules, they need to let me know. I shall use my discretion to decide whether to allow a separate stand part debate on individual clauses and schedules following the debate on the relevant amendments.

Clause 1

ESTABLISHMENT OF ARIA

Daniel Zeichner (Cambridge) (Lab): I beg to move amendment 2, in clause 1, page 1, line 3, leave out "Advanced Research and Invention Agency" and insert "Advanced Research and Engineering Projects Agency".

This amendment would modify the name of the Advanced Research and Invention Agency to the Advanced Research and Engineering Projects Agency.

The Chair: With this it will be convenient to discuss the following:

Amendment 3, in clause 1, page 1, line 5, leave out "ARIA" and insert "AREPA".

This amendment would reflect a modification to the name of the Advanced Research and Invention Agency to the Advanced Research and Engineering Projects Agency.

Amendment 4, in clause 1, page 1, line 6, leave out "ARIA" and insert "AREPA".

This amendment would reflect a modification to the name of the Advanced Research and Invention Agency to the Advanced Research and Engineering Projects Agency.

Amendment 26, in clause 15, page 5, line 35, leave out "Advanced Research and Invention Agency"

and insert

"Advanced Research and Engineering Projects Agency".

This amendment will modify the ARIA short title.

Amendment 1, title, line 1, leave out

"Advanced Research and Invention Agency"

and insert

"Advanced Research and Engineering Projects Agency".

This amendment would modify the long title of the Bill to reflect a change to the name of the Advanced Research and Invention Agency to the Advanced Research and Engineering Projects Agency.

Daniel Zeichner: It is a pleasure to serve with you in the Chair, Ms McVey. I look forward to a fascinating discussion about a very important set of issues. Let me start by apologising on behalf of the shadow Minister, my hon. Friend the Member for Newcastle upon Tyne Central, who is delayed this morning but will be joining us in an hour or so. I have the pleasure of opening this morning's sitting. I thank those who set up last week's evidence sessions. I have sat on a number of Bill Committees in my short time in Parliament, and I have to say that I think it was the most informative evidence session that I have come across. I hope we all learned something from it—I certainly did.

The evidence session led directly to the first set of amendments. David Cleevly suggested this idea, in fact, and I remind the Committee of what he said in his observations:

"All the examples given of contributions that make a difference have all been, it strikes me, about engineering, so I suggest that we rename this the 'Advanced Research and Engineering Agency'. To be honest, 'invention' strikes me a bit like something in the 1950s, with somebody emerging from a shed with a gadget that has just blown their hair off"—

a bit like my hair this morning. He continued:

"Peter Highnam pointed out 'projects', so we might actually consider it to be the 'Advanced Research and Engineering Projects Agency'."—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 74, Q76.]

That is a really important point. I suspect that much of the discussion today and in successive sittings will really be about the finer points of setting up an organisation, and will be relatively dry. Amendment 2 goes to the heart of what the agency is actually about and its whole purpose.

I very much hope that we will get wide engagement from all members of the Committee. I know that Government Whips are sometimes inclined to suggest that Government Members should hold their fire, but we have lots of expertise here today, and I think we are all trying to get the best outcome, so I hope people will feel that they can contribute.

One thing that struck me about the evidence session was just how many witnesses highlighted the need for greater clarity about the purpose of the agency. Professor Wilsdon put it very well when he said:

“I think that trying to bring more clarity, or at least a sense of how this issue will be addressed through the governance of this new thing, is really important.”

He warned:

“Otherwise, you or your successors, and we or our successors, will be back here in a few years’ time, asking ourselves why it did not work.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 23, Q19.]

Commentary and observations from the outside world say the same thing. The Government may have a view, and I hope the Minister will take the opportunity to clarify it. Our concern is that the Bill lacks clarity.

I found the evidence session very helpful, particularly because I started with a bit of prejudice: I thought I would struggle with anything that had been promoted by Dominic Cummings. I am not a grudgey sort of person—I do not bear a grudge. Actually, I do bear more than 65 million grudges on behalf of every man, woman and child in the country who was outraged by his behaviour this time last year, without going into what happened before that. It was disappointing that he did not choose to make himself available for our evidence session, because this is clearly a project associated with and driven by him. Perhaps that was for the best, though, because it makes it less about him and more about the future of research and development in our country.

The proposed name change came out of the evidence that he gave to the Select Committee on Science and Technology, which I watched. As one often does late in the evening, I was scrolling through the TV channels and suddenly I found hon. Members interviewing Dominic Cummings on the TV. Usually, I would move on to the football, but there was something extraordinarily engaging about that hour-long session. It seemed meandering and self-indulgent, and it revealed his loathing and hatred for everything in the world, particularly bureaucracy: whether it be Brussels bureaucracy, the blob or the way in which research and development work in this country, everything is designed to stop the process of invention emerging.

We all want it to be easier to do things. None of us wants bureaucracy, but most of us understand why it is there—there is a reason for it. Of course, we have to fight against it, but particularly in the last week or two it has become strikingly obvious why we need it: to make sure we do not leave ourselves open to cronyism and the abuse of public money. Over the years, all politicians have felt just how frustrating democracy can sometimes be. Would it not be so much better if just a few of us—a few blokes, probably—could just get together with Dominic and run the country? Would that not be so much better? We have seen examples of that through history and in other places. Without going back to clichés, there is a reason why we stick with democracy: it is better than all the other difficult systems.

I was struck by Mr Cummings’s constant invocation of the way things have been discovered in the past. He has talked frequently of the Laboratory of Molecular Biology in Cambridge, which is very dear to me. For those who come to Cambridge on the train from London, although there are many striking buildings outside Cambridge, it is particularly iconic building. It

is not just a building, though; hugely important work goes on in it. Scientists from across the world, particularly Europe, are doing fantastic work. They have won a disproportionate number of Nobel prizes over the years.

Mr Cummings’s view was to hark back to the starting point, when there were some fantastic breakthroughs in a shed on the site of the old Addenbrooke’s Hospital. He almost seemed to think that they needed to be in the shed to get the breakthroughs. He was harking back to a very different world—perhaps the world that he wants us to be, back in the 1950s. That is not the world we are in now. That is the crunch with the name change.

What is in a name? In this case, a great deal. The word “invention” in the current title is useful to create a cheery acronym—I will come back to that—but actually it points to completely the wrong approach. As David said, it is bit like something from the 1950s, when someone emerges from a shed with a gadget that has blown their hair off. It is a sepia-tinged view of innovation: “The great breakthroughs were achieved against the odds, largely by blokes in sheds.” Well, perhaps they were, but that was then and this is now, and all the other witnesses painted a very different picture of how innovation happens.

Tabitha Goldstaub was particularly clear. She told us:

“I worry also about the lone genius model. We are well beyond individual success being seen like that. This is all about community. One of the things I have heard time and again is that people do not want to be funded as individuals but as groups of people. It is a community that would come together around a programme manager that is really important.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 54, Q52.]

That was the real force of the evidence from those who know best—those who have been doing this in America. The session with the people from the Defense Advanced Research Projects Agency was particularly powerful. DARPA does not have invention in its title and there is a good reason for that: it is not what it does.

Dr Highnam was particularly clear:

“DARPA: defence and national security. Clear mission; clear scope in which to work. Of the ARPA-like entities around that I am aware of, the only one that very closely follows the DARPA model would be the Intelligence Advanced Research Projects Activity in the US intelligence community. When you change what I would regard as the key elements—ephemeral or temporary people, project based, and no fixed assets—that have made DARPA nimble and forward leaning for 63 years now, you get something else.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 43, Q37.]

Note that he said “project based”—it is about projects, which is why that is in our amendment. It is a much more accurate description of what the agency should be about.

Dr Highnam said more, and this is probably more significant:

“The p in DARPA stands for ‘projects’, which is critical for a place like DARPA. We are not doing technology area x or y just because, and we do not do it for the long term. We have projects that are well defined at the beginning. A case has to be made. They are monitored, they have metrics and all manner of independent evaluation associated with them before we go out to find the best teams we can to participate and to be funded to work on that research. Then that project ends.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 40, Q34.]

He could not have been clearer—that is what makes it work.

[Daniel Zeichner]

If we contrast that clarity with the Bill, we see that the evidence sessions clearly revealed the muddle in Government thinking, as a succession of witnesses tried to get their heads around what this agency is for. It is certainly not clear in the Bill. As it stands, without amendment 2 the muddle over what the agency does remains unresolved, which inevitably means a muddle over money and resources, because while managing projects does not necessarily require a big spend, invention is quite another matter. The name change links to that vexed question of whether it is new money.

When Dame Ottoline Leyser of UK Research and Innovation—she is a constituent of mine—was asked what she would do with an extra £800 million if she had it to spend, her reply was skilful in the extreme. It was tactful, but it was a laugh-out-loud moment, because it was quite clear that this is not what she would choose to spend it on. Professor McDonald made a similar point, as did a succession of other witnesses. All of them were absolutely clear that it has to be new.

We in the Opposition certainly want new. Our aspiration is to go beyond 2.4%—we want 3%. We are happy to support new money, but I suspect that if it were a Labour proposal, the first question would be, “Where is the money coming from?” Perhaps the Minister can tell us that, because I do not think we have any clues. We welcome it, none the less.

In reality, despite the creative attempts at amendments from us and from the Scottish National party, we know that future money cannot be guaranteed. That is why the purpose of the agency is so important and why the “Projects” element matters so much.

The amendment also seeks to add “Engineering”, partly as that was suggested by David Cleevly in his witness statement. As he rightly pointed out, many of the examples are engineering examples. I have to say “partly” because the shadow Minister, my hon. Friend the Member for Newcastle upon Tyne Central, is a chartered engineer. Perhaps that is not actually so significant. If we took out “Engineering”, our amendment would result in the name being ARPA—the Advanced Research and Projects Agency—which is a straight copy. We are seeking to emulate largely what ARPA has achieved, which I am not sure is such a bad thing.

I have to say that on Second Reading I had a slightly tetchy exchange with the Secretary of State about whether the proposed agency was modelled or based on whatever. It is clearly learning from experiences. We have some other not dissimilar examples: we have the small business research initiative, which is the SBRI. I have spent many years trying to promote and support it, and it is based on the American model, the SBIR—small business innovation research—so we have some examples of borrowing from the Americans and switching the letters round. Given the number of different American ARPAs, we could end up with ARPA UK, or it could be ARPA GB or ARPA England—it depends how the world goes in the years ahead—but, frankly, we are not precious about it. However, the shift from “Projects” to “Invention” really does matter, so if the Government chose to make that change, or whether it was an accident, I would like the Minister to explain why and what the Government think is significant about the word “Invention” in the title of the agency.

Dr Highnam of DARPA said that if one does not do it in the way that he described, one gets something else. It is therefore only reasonable to ask the Minister what it is that she wants to do differently. What is it that she wants the agency to be? If the agency is going to cost an initial £800 million, what makes her confident that it will work? We heard from a number of witnesses, including Felicity Burch, who talked about previous efforts to move our research system closer to the “edge of the edge”, as it has been described. I am thinking of the Technology Strategy Board and the industrial strategy challenge fund. Felicity Burch said in her evidence that setting the agency up on a statutory basis makes a difference, and I think it does, but only if it is done in the right way.

Let me conclude by returning just briefly to the operative theme that I have encouraged throughout the debate so far. I have been through Puccini and Purcell, but to finish where I began with Dominic Cummings, could we annoy him a little bit more by suggesting that the song might be the “Ode to Joy”? It is not quite an aria, more a collective chorale, but I think one of the projects we could turn to is to create more joy. In general, let us have clarity by making the purpose of the agency clear in its title. Let us recognise that it really is about projects, and do so by adopting the series of amendments under consideration. That would give the new agency a genuinely clear purpose, with the challenge framed by the Government. In our view, that has a much better chance of success, and as such is worth supporting with enthusiasm.

The Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy (Amanda Solloway): What a pleasure it is to be under your chairmanship, Ms McVey, and to listen to the hon. Member for Cambridge. He talked about a wide range of issues, most which I am sure will be addressed in further debate. In this instance, I will concentrate on amendment 2 and those grouped with it.

The creation of ARIA represents an exciting opportunity to add to our already excellent research and development funding landscape. That came out very strongly on Second Reading, and I hope that today’s debate and last week’s evidence sessions demonstrate the importance of the legislation. I would like to place on record my thanks to the Opposition parties for the constructive way in which they have approached the Bill thus far, and I look forward to discussing the amendments that they have tabled.

Amendment 2 and associated amendments would change the name of the agency to the advanced research and engineering projects agency, or AREPA. I must say that when the hon. Gentleman raised this option last Wednesday, I did not realise that it was a serious suggestion. As I am sure he can imagine, a certain amount of thought and discussion has gone into choosing the name of the agency, and I do prefer the musical reference to naming the agency after a flatbread.

On a serious note, I recognise how central engineering successes have been to the historic breakthroughs of ARPA and DARPA in the United States. I found the evidence of Sir Jim McDonald of the Royal Academy of Engineering and others hugely interesting. I share the hon. Gentleman’s concern that those contributions should not be overlooked. I very much hope that ARIA

builds on the history of engineering excellence that we have right across the UK, and supports the next generation of transformational breakthroughs. The powers of the body are key. I assure the Committee that just as UK Research and Innovation is able to provide funding for engineering research through the Engineering and Physical Sciences Research Council, ARIA's powers extend to conducting engineering projects in exactly the same way as projects in any other area of science. That important discipline has not been forgotten. Our ambitions can be achieved without renaming ARIA, and I cannot accept the amendment.

9.45 am

Daniel Zeichner: I am grateful to the Minister. I admit that there is a sense of gentle joshing in the name change. It is not the engineering issue that is important to us, but the invention issue. I listened closely to for an explanation from the Minister of why “invention” has been chosen, but did not hear one; I would be grateful if she intervened to explain. I outlined clearly why the projects element is so important. We heard a consistent view from witnesses throughout the evidence sessions, so I see no reason why the amendment should not be seriously considered.

Looking at the numbers around me, I do not expect to secure an overwhelming victory in a vote, but this amendment will go on for further discussion elsewhere. I hope that it will be thought about carefully, because it simply cannot be denied that, both in the evidence sessions and outside this place, there is concern about clarity of purpose. We all want the agency to succeed, and the amendment is a constructive suggestion. Personally, I would go for “ARPA”, to make it absolutely clear that we are trying to do what the Americans have achieved in the past. Neither the Minister nor anyone else has given me a sense of clarity about what are actually trying to achieve—to say, “That is what we need to achieve, and that is what is missing.” That is why I wish to divide the Committee on the amendment.

Question put, That the amendment be made.

The Committee divided: Ayes 3, Noes 9.

Division No. 1]

AYES

Butler, Dawn
Furniss, Gill

Zeichner, Daniel

NOES

Baker, Duncan
Bell, Aaron
Crosbie, Virginia
Fletcher, Mark
Hunt, Jane

Mayhew, Jerome
Metcalf, Stephen
Solloway, Amanda
Tomlinson, Michael

Question accordingly negatived.

The Chair: As the remaining amendments to clause 1 are consequential to amendment 2, to which the Committee has just disagreed, I will not call amendments 3 or 4, as it would be inconsistent with the decision that the Committee has just reached.

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: The establishment of the Advanced Research and Invention Agency as a statutory corporation means that the body has its own legal personality that is distinct from the that of the Crown or its individual members, as set out in paragraph 1 of schedule 1. That allows ARIA to enter into legal relations such as contracts, and to hold property in its own right.

A statutory corporation also allows the specific terms of the relationship between Government and ARIA to be set out in law—the composition of the board and the appointments process, for example. In setting that out, we have sought to balance the freedom required for ARIA to deliver transformational scientific and technological advances, but with appropriate ministerial oversight. I hope that hon. Members agree that that is the right vehicle for the creation of the agency.

Question put and agreed to.

Clause 1 accordingly ordered to stand part of the Bill.

Schedule 1

THE ADVANCED RESEARCH AND INVENTION AGENCY

Dawn Butler (Brent Central) (Lab): I beg to move amendment 5, in schedule 1, page 6, line 10 at end insert—

“Memorandum of understanding

2 (1) ARIA and UK Research and Innovation must prepare a memorandum of understanding.

(2) The memorandum must set out how ARIA and UK Research and Innovation intend to co-operate with each other and avoid overlap between the exercise by ARIA of its functions and the exercise by UK Research and Innovation of its functions.

(3) The memorandum shall be reviewed on an annual basis and revised as necessary by agreement between ARIA and UK Research & Innovation.”

This amendment would require ARIA and UKRI to prepare a memorandum of understanding setting out how they will collaborate and avoid overlap.

The Chair: With this it will be convenient to discuss amendment 6, in schedule 1, page 6, line 2, at end insert—

‘(c) the Chief Executive Officer of UK Research and Innovation; and’.

This amendment would make the CEO of UKRI a non-executive member of ARIA in order to achieve greater collaboration and communication between the two bodies.

Dawn Butler: It is a pleasure to serve under your chairmanship, Ms McVey. I do not think anyone will vote against the amendment, because all it seeks to do is ensure that there is a memorandum of understanding between ARIA and UK Research and Innovation about how they will work together. The two organisations will be working on the same themes, though doing things slightly differently, and they need to communicate. I am happy to give way to anyone who thinks it is not a good idea that UKRI and ARIA communicate. The amendment is practical and sensible and seeks only to clarify how they would work together.

Our evidence session was informative. Dame Ottoline Leyser from UKRI said:

“The people employed at ARIA will absolutely need to understand deeply what UKRI is doing and what the opportunities are across that research base in order to deliver their vision. I would expect a very close working relationship with ARIA to allow that to happen.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee, 14 April 2021; c. 6, Q3.*]

[Dawn Butler]

When she said that, I thought that the relationship must have been written in the legislation and I had missed something, because she said it as though it was going to happen. I went back to the Bill to have a look, but nothing in it says that UKRI and ARIA have to work together or at least know what each other is doing. I thought that quite strange. When I asked her how she expected that to happen, she said “naturally”. We in Parliament make laws and legislation; we do not leave things to happen naturally if we can we put them on the statute book. The amendment seeks only to have a memorandum of understanding between the already established UKRI and the newly established ARIA.

If the Committee votes against the amendment, people outside will not understand. They will ask, “Why don’t you want a memorandum of understanding?” Everything cannot be done just on trust. We have trust and transparency, but right now ARIA has neither, and it will not be subject to freedom of information rules. It is the wrong approach to say to people outside, “We are going to give £800 million to an organisation that will have no oversight, no FOI and no link to UKRI.” How would that be sensible, especially when—I say this gently—the Government are caught up in sleaze at the moment? That would not help at all. People will say, “You want £800 million to go to whom and to do what?”

Ultimately, we know that men of a certain age get these opportunities, and these men tend to fail upwards. Without the amendment, we are saying that we will allow people to fail upwards and we will not know what they are doing because failure will be part of what ARIA is. We accept that failure can be a part of ARIA, but there needs to be some oversight and connection to the already established UKRI.

Aaron Bell (Newcastle-under-Lyme) (Con): I thank the hon. Member for her service on the Science and Technology Committee with me, where we have been discussing this issue and the covid crisis over the last year. She made a point about men of a certain age. Last year, it was two women of a certain age—Dido Harding and Kate Bingham—who helped to respond to coronavirus. At the time, the Opposition made various allegations of cronyism, particularly about Kate Bingham, which ought to be withdrawn now that we have seen the success of what can happen when we take away some of the administrative burdens, focus clear-mindedly on a key goal and get it delivered. Making these allegations of sexism when we have had two women leading our response to coronavirus is not appropriate.

Dawn Butler: I thank the hon. Member for his service on the Science and Technology Committee, where we often agree and very often disagree. Of course we praise what goes well, but let us not forget that £14 million was spent on a test and trace system that was scrapped, or that Northern Ireland spent £1 million on a test and trace system that works perfectly well. Let us not forget those facts. Now, we are talking about £800 million.

Professor Pierre Azoulay said,

“It is important not to put those two agencies in competition; they both have a role to play.”—[*Official Report, Advanced Research and Invention Agency Bill (Second sitting)*, 14 April 2021; c. 46] Both agencies have a role to play; let them work together. Let us work on the premise that it will be a success.

Amanda Solloway: As a female Science Minister, I fully understand the sentiment behind the proposed amendment. I agree that it is important that ARIA and UKRI co-operate for ARIA to be a coherent addition to the UK R&D funding landscape.

I thought that Professor Dame Ottoline Leyser, the CEO of UKRI, really spoke eloquently on this point last week when she said:

“The kinds of relationship that one wants to have with key players across the system are not things for which you necessarily legislate. They are about maintaining open lines of communication and building high-quality personal relationships with different actors in the system.” [*Official Report, Advanced Research and Invention Agency Bill (First sitting)*, 14 April 2021, c. 15.]

I agree. It is important that we do not over-engineer ARIA’s governance arrangements and obligations in the Bill such that we risk binding the body and creating a bureaucratic process. I am concerned that the need for ARIA and UKRI to agree and annually review an MOU creates just such an administrative burden.

I also agree with Professor Dame Ottoline Leyser when she says that this happens organically. After all, it will be in ARIA’s interests to maintain a dialogue with UKRI to understand the work opportunities and key research opportunities in the UK R&D landscape. The framework document which will be agreed between BEIS and ARIA will set out the broad principles according to which ARIA must interact with other public R&D funders, which will, of course, include UKRI. For this reason I cannot accept the amendment, and I hope that the hon. Member for Brent Central will withdraw it.

Daniel Zeichner: I want to question the Minister on the difference between an MOU and the document that she has just referred to. It seems to me that we are not far apart on that. Could we not have an MOU?

Amanda Solloway: The framework document will be drawn up by the leadership of ARIA, and it is really important that that is how it will be devised. It will not be a Government-led document; it will be drawn up by the leadership and with ARIA.

Dawn Butler: I think the Minister has just described an MOU. A framework document that is agreed by UKRI and ARIA, not by the Government, is an MOU, I believe.

Jerome Mayhew (Broadland) (Con): In earlier comments, the hon. Lady referred to the evidence obtained offline. When she asked, “How would this occur?” Professor Dame Ottoline Leyser replied, “Naturally.” The Lady’s response is to ask, “Why would we rely on that, if we can put something on the statute?” I suggest that it should be the other way around. In this country, we legislate only where we have to, not where we can.

Dawn Butler: The Government are creating a new agency and spending £800 million. They are saying that this new agency should not be subject to the Freedom of Information Act 2000. They are saying that it will fail, a lot, and we need to accept that failure happens in science. That is fine—I used to be a computer programmer, and I know that sometimes you try things and they do not work—but this is very new. We should not put it in a

silo by itself, with no proper link to UKRI. I do not believe the hon. Member believes that there will be no link, because the Minister has just described this document as a memorandum of understanding by another name. I do not think there are actually any disagreements about having the memorandum of understanding.

10 am

It is important to say right from the outset that we want communication between UKRI and ARIA, so that ARIA will be a success. Otherwise, we are limiting the success of ARIA. We took evidence from Tabitha of CognitionX, who is the chair of the AI Council. I would love her to run ARIA; her evidence was so enlightening, and I would love somebody like that to run it. She also talked about the link to UKRI and other industries. I do not think there is any difference between us. The Minister described a memorandum of understanding. To be fair, we should just continue in the way we have done—constructively—and make the amendment.

Daniel Zeichner: I have learned something this morning. I too was a computer programmer. I hope my hon. Friend was a better programmer than I was—I worry about the code that I left for others.

On whether it is better to have it in the legislation, which is the point raised by the hon. Member for Broadland, does it strike my hon. Friend as odd, particularly at a time when the Government are under such scrutiny for relaxed arrangements involving texts, WhatsApp and all the rest of it? Is that not exactly the reason it should be put in legislation—so that it is clear for everybody?

Dawn Butler: My hon. Friend makes a very valid and powerful point. There are ongoing investigations—Greensill, PestFix and VIP lanes. Let us avoid such accusations by agreeing a memorandum of understanding between ARIA and UKRI. Let people not question the role of ARIA: we are expecting the public to accept failure as an essential part of ARIA, and they are going to accept failure. Let the public understand that there will be some link to UKRI, which is an established agency.

Jane Hunt (Loughborough) (Con): I wish to refer to some of the things that were said during the evidence sessions. In the very helpful session with Professor Dame Ottoline Leyser, she talked about the “edge of the edge”, to which we have already referred, but she also said directly after that that leaving them the freedom of decision making may attract the special people we need in that role. She was talking about the chief exec and the role of the people who will be looking after ARIA. That is very important. What we do not need to do is create restrictions around this. This is £800 million that is separate from UKRI. Professor Leyser was very happy about that; in fact, she wanted it to be quite separate, so that it was free and allowed to develop ideas and inventions.

The Opposition referred to a muddle when they talked about clarification, but I think what they mean is they want to meddle. They want to put restrictions in place—any kind of restriction that would show that we are in charge. Well, we are not. We are not great inventors. The people who will be in ARIA will be great inventors, and they will create good things.

The hon. Lady mentioned that she was happy to accept failure, but she also beat us around the face and neck about the £14 million that was spent on test and trace, which failed. Come on—we have to allow them to fail.

Dawn Butler: I was almost with the hon. Lady up until the £14 million. At the end of the day, Northern Ireland spent £1 million on a test and trace system that worked. I could have programmed a test and trace system—it might have taken me a few years, but I could have done it—for a lot less. It is unacceptable to spend £14 million on a test and trace system that failed and had to be scrapped. It is shocking for the hon. Lady to stand up and even consider that to be a defence.

A memorandum of understanding does not restrict anybody. A memorandum of understanding is exactly that: a memorandum of understanding. The hon. Lady talked about the CEO of UKRI. Amendment 6 talks about making

“the CEO of UKRI a non-executive member of ARIA in order to achieve greater collaboration and communication between the two bodies.”

What is wrong with having greater collaboration between UKRI and ARIA? I do not understand. Nobody has yet stood up to tell me why there is a problem with having collaboration between UKRI and ARIA. None of the Members that have spoken has given a reason why there should not be collaboration between the two. ARIA can still go off and do its thing, and fail away, but it needs to know what UKRI is doing. What is the problem?

Question put, That the amendment be made.

The Committee divided: Ayes 5, Noes 9.

Division No. 2]

AYES

Blackman, Kirsty	Furniss, Gill
Butler, Dawn	
Flynn, Stephen	Zeichner, Daniel

NOES

Baker, Duncan	Mayhew, Jerome
Bell, Aaron	Metcalfe, Stephen
Crosbie, Virginia	Solloway, Amanda
Fletcher, Mark	Tomlinson, Michael
Hunt, Jane	

Question accordingly negatived.

Amendment proposed: 6, in schedule 1, page 6, line 21, at end insert—

“(c) the Chief Executive Officer of UK Research and Innovation; and”—(*Dawn Butler.*)

This amendment would make the CEO of UKRI a non-executive member of ARIA in order to achieve greater collaboration and communication between the two bodies.

Question put and negatived.

Kirsty Blackman (Aberdeen North) (SNP): I beg to move amendment 28, in schedule 1, page 6, line 22, at end insert—

“(4) The Secretary of State must ensure that—

- (a) at least 50% of the other members appointed under
- (3)(c) are women; and

[Kirsty Blackman]

- (b) where the number of members under (a) would be an odd number, the calculation of 50% of other members should be made as if the board had one fewer non-executive member.”

This amendment is intended to ensure that the Secretary of State appoints a significant percentage of women as other non-executive members.

The Chair: With this it will be convenient to discuss amendment 9, in schedule 1, page 6, line 24, at end insert—

“(5) The Secretary of State must, in appointing the members of ARIA, have regard to the diversity of the members including the representation of those with protected characteristics.

(6) In this section, ‘protected characteristics’ has the meaning given by Part 2, Chapter 1 of the Equalities Act 2010.”

This amendment would require the Secretary of State to have regard to the diversity of ARIA’s board when using their powers of appointment.

Kirsty Blackman: It is a pleasure to be able to take part in this Bill Committee. Unfortunately, I had to come to London to do so, but it is nice to see some of the faces that I have not seen for a while, other than on little screens. I will start with a bit of fluff: I thank the Clerks for their huge amount of hard work in assisting us with the amendments that we tabled to the Bill. It was really helpful. I am sure they provided the same level of help to everybody else, but we very much appreciate it.

I will speak to amendment 28 and the Opposition’s amendment 9. Our amendment 28 relates to the number of women to be appointed to the board in non-executive positions. There is some lack of flexibility around the positions because two are taken by named individuals. There are also positions that are not appointed by the Secretary of State because they are executive positions. In relation to the non-executive members, it is incredibly important that a significant percentage of women is included among them.

The hon. Member for Broadland said that we should legislate only where we have to. I think in this case it is incredibly important to legislate. We know that only 12% of all engineers are women, and that 25% of 16 to 18-year-old girls would consider becoming an engineer as opposed to 51.9% of boys in that age group. There is an incredibly hard glass ceiling, particularly in science, technology, engineering, and mathematics, and in the kind of roles that will benefit from the funding that ARIA will receive.

We know that young women, and young men, are more likely to take up and aspire to positions if they can see people who look like them in those positions, see people who have succeeded, and know that there is an opportunity to climb the ladder rather than hit the glass ceiling, as people so often do in engineering. This would be a real opportunity for the Government to make it clear that it is incredibly important to have women in these roles. Maths is not just for boys; it is a subject for everybody. When I was doing my advanced higher maths, I was the only girl in the class. Not one other girl had chosen to take advanced higher maths. It was not a small class, it was a class of about 20, and it was because people felt that it was a boys’ subject and girls should not be taking it.

It is important that the Government agree to such an amendment. If the Minister is unwilling to, it would be helpful to hear how the Government plan to increase the gender balance on the board and ensure that women are appointed to these roles. For example, they have said to FTSE companies that they need to have a percentage of women on those boards, but they are not putting that into the legislation in this instance and it is important that they do so.

The Opposition’s amendment 9 in relation to diversity is an incredibly good amendment. In fact, I am quite upset I did not think of it. We have a similar problem with diversity in engineering. Mainly white men are in these positions, and people in school do not look at these positions and think, “I’m going to aspire to do this,” because they do not see people like them in those roles.

My hon. Friend the Member for Aberdeen South and I represent Aberdeen constituencies, where Robert Gordon University and Aberdeen University do a lot around engineering, oil and gas. We have thankfully seen a significant amount of immigration to our city because of the oil and gas. Outside London, the highest percentage of non-UK-born citizens is in Aberdeen. That means a significant number of people from ethnic minority groups are in the engineering profession, but again we have the same issue. It is very unusual to go into a room full of oil and gas executives and for any of them not to be white, and it is fairly unusual for any of them to be women, although we are seeing an increase in those numbers. These amendments would make clear the Government’s intentions and say to organisations such as the FTSE companies that are being asked to have gender balance on their boards, “We are doing this too; we are leading by example”.

Aaron Bell: It is really nice to see the hon. Member back in London. I know it is a burden for SNP Members to come all the way down to the United Kingdom Parliament, but it is lovely to see her in person.

I do not think the Government are doing so badly on diversity, particularly on women. I reassure the hon. Member and the Opposition that, in relation to their amendments, the panel will be selected by Sir Patrick Vallance and other independent advisers. The job that they have done during covid demonstrates how many women we have in positions of scientific importance. We have the women we mentioned earlier: Dame Jenny Harries, Dame Ottoline Leyser, who gave evidence to us, and the Science Minister herself. From the diversity perspective, I think the absolute hero of the press conferences has been Professor Jonathan Van-Tam, who has been a wonderful communicator to the whole country, so I gently say to the hon. Member that I do not think it is as bad as all that and that the amendments are therefore unnecessary.

Kirsty Blackman: I was hoping that I was not being too critical of the Government. I did not intend to say the UK Government are terrible in this regard. I think they have done some good things around gender balance on boards, for example. I would have gone further, but they were a good start. I am not hugely critical of where things are, but I think a kind of stamp on this Bill, to say, “This is the direction we would like to go to”, would be helpful.

This can be done. We have done it in Scotland with the Scottish National Investment Bank. Our amendment is very similar to the proposal in relation to the investment bank—we are doing a huge amount for our public bodies. The investment bank intends to have a significant number of women on it, and it is the same for gender representation on public boards in Scotland more generally. I would very much appreciate it if the Minister let us know whether the Government will take the actions that we have proposed in our amendment. If not, what do they intend to do to ensure that people from diverse backgrounds are included?

10.15 am

Chi Onwurah (Newcastle upon Tyne Central) (Lab): It is a great pleasure to serve under your chairship, Ms McVey. I apologise to the Bill Committee for not being here at the start. That was due to a medical appointment that I could not avoid. I am sorry to have missed the opening speeches.

Labour welcomes this debate and the interest and proposed investment in advanced research and innovation through this agency. We have concerns about the Bill as it stands, which will I will go through in some detail, amendment by amendment. We champion our world-leading scientists, and we recognise the importance of giving science and engineering in this country the opportunity to enable us to build back better and create a fairer and more progressive world.

Amendment 9, which stands in my name and those of my hon. Friends, follows on nicely from the amendment moved by the hon. Member for Aberdeen North. I am sorry to have missed part of her remarks, but I caught most of them. We echo her desire to see diversity on the board of ARIA. I was very drawn to her comments about the oil industry in Aberdeen North. I worked as an engineer for 20 years before coming to Parliament, and I spent some of that time in Nigeria working not in the industry but with oil engineers, so I know about the lack of diversity that she is referring to and how challenging it can be to be the only person of one's gender, ethnicity or class in the room.

Our amendment seeks to ensure that, in appointing members of ARIA,

“The Secretary of State must...have regard to the diversity of the members including the representation of those with protected characteristics.”

“Protected characteristics” has the meaning given by part 2, chapter 1 of the Equality Act 2010. That would require the Secretary of State to have regard to the diversity of the board when using their powers of appointment.

Labour wants to ensure that agencies such as ARIA are of benefit to the entire nation—indeed, to all nations in the United Kingdom—and every region and citizen. It is clear that, at the moment, diversity is not the strong point of our science establishment. Only 7% of managers, directors and senior officials in academic and non-academic higher education positions are black, Asian or minority ethnic, and only 24% of the UK STEM workforce are women. That has to change if we are to create a welcoming and inclusive culture in United Kingdom research and development. The Government's R&D roadmap states:

“Equality, diversity and inclusion (EDI) is a critical aspect of research culture...UKRI will develop and launch bold initiatives to increase the participation, retention and promotion of a diversity of talent into R&D.”

I know that the Minister takes these issues seriously, so why is there no reference to diversity in this new agency? This Bill is a real opportunity for action. If the Government are serious about a forward-looking diversity programme, they must ensure that ARIA has diversity at its heart.

We want ARIA to be world leading and to make breakthroughs of which the whole United Kingdom can be proud. We cannot allow the research breakthroughs of tomorrow to be held back and hamstrung by old attitudes of the past. We are never going to unlock the full potential of our research sector if we do not use the talents of everyone. There are real issues with diversity in the UK science sector, with black and minority ethnic men 28% less likely to work in STEM than white men, and women representing 9% of people in non-medical STEM careers. Yet we face a shortfall of 173,000 STEM workers, which is estimated to cost the sector £1.5 billion a year.

The reason I am so determined that ARIA should reflect the importance of diversity is because when I graduated from Imperial in 1987—a long, long time ago—around 13% of engineering students were women. In my year at Imperial it was 12%. If we fast forward some 30 years—more than a quarter of a century—the figures have increased by 2 percentage points. In a quarter of a century, that is the amount of progress we have made in this critical area. We must not show any complacency or think that this will happen over time. As we have seen, it does not happen over time; it requires action.

Stephen Metcalfe (South Basildon and East Thurrock) (Con): Will the hon. Lady give way?

Chi Onwurah: I am happy to give way to an hon. Member who is a great champion of diversity in science.

Stephen Metcalfe: I am grateful to the hon. Lady for giving way. Does she recognise that the Government have taken steps in this direction, particularly during the year of engineering in 2018 and in the subsequent creation of an engineering envoy to try to continue to promote engineering to everyone, regardless of background, gender or ethnicity? The Government are alive to the issues and take them seriously, so mandating it in this amendment is not the right way forward. We need to do exactly what the hon. Lady said, which is to set up projects that let people decide that engineering is the career for them.

Chi Onwurah: I am grateful to the hon. Member for his intervention. I recognise the sterling work that he did as Chair of the Science and Technology Committee and as the Government's envoy during the year of engineering, and that he now does as chairperson of the Parliamentary Office of Science and Technology. He is not talking about this issue now simply because it has become more fashionable; he has a long history in this area.

I did not mean to imply that the Government have not taken any action. It is important for the Government to promote engineering, but in this, as in everything, it is the outcomes that matter, not the words. At the heart of this Bill is the creation of an institution. There are many challenges facing our research environment, including the lack of private investment in research and the lack of venture capital investment in early start-ups.

[Chi Onwurah]

The Government have chosen to respond with an institution, and therefore it should reflect the Government's priorities when it comes to diversity. If part of the answer to the challenges facing the scientific community is a new institution, at the heart of it must be the diversity that we want to see in the science establishment.

Obviously, I am not the only person to raise this issue; we heard earlier from the hon. Member for Aberdeen North, and it was clear from witness evidence that there was significant support for ARIA acting as an agent of change in this important matter. Professor Leyser, the chief executive officer of UKRI, said:

"I have to think about all parts of the system. I have to think about the people—do we have the right kinds of people in the system, the right mix, the right diversity, the right set of skills, and the right career trajectories and pathways through the system?"

If the person who is in charge of the greatest portion of the UK R&D budget has to think about that, why not ARIA? We also heard from Tris Dyson of Nesta Challenges, who said specifically of the proposed agency that

"we think that there is an opportunity to explore new avenues and do things slightly differently. Some of the opportunities that that presents, both through ARIA and more generally, is around boosting the diversity of people involved in frontier technology and innovation and improving geographical reach."—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 5-7, Q3.]

I hope that the Minister will explain how that will be realised if not through an amendment such as amendment 9.

We also heard really important evidence from Dr Dugan of Wellcome, who is a past director of DARPA. She said:

"What I can tell you about diversity from my own experience, both in Silicon Valley and at DARPA, is that for decades we have known that specificity of goal and outcome is a good way to get more equality and diversity in assessment of ideas and in people conducting or pursuing those ideas."—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 39, Q33.]

We will come on to consider this in further debate, but currently ARIA has no mission, no specificity of outcomes, and no diversity requirements.

Virginia Crosbie (Ynys Môn) (Con): Does the hon. Lady recognise that the Secretary of State will follow the code governing public appointments, which includes the principle that public appointments should reflect the diversity of our society?

Chi Onwurah: The hon. Lady makes an interesting point and it raises two issues. First, how the CEO will be recruited and which rules for public appointment that process will follow is not clear in the Bill, so perhaps the Minister will provide that information. If the Secretary of State has to follow those rules, surely the amendment simply makes it clear what he—he in this case—has to do, and ensures focus on and recognition of the requirements. I do not feel that those two considerations are incompatible.

Daniel Zeichner: Does my hon. Friend agree that this is a fundamental issue. There is a real problem particularly around design, as Caroline Criado Perez identified in her book "Invisible Women: Exposing data bias in a world designed for men"—some of us attended the

book launch here a couple of years ago. Extraordinarily, she pointed out that a swathe of design was done without women in mind at all, so crash tests and so on do not work because they are tested on the wrong people. That reflects the danger of having a board without a wide range of people. I read somewhere the other day that the armed forces in some country had only just discovered that women require different underwear from men. There is a blinds pot here, and it goes back to blokes in sheds I am afraid.

Chi Onwurah: I am grateful to my hon. Friend, and I agree wholeheartedly. The fact that most technology and science has been designed and developed by a narrow demographic minority has great implications for our society. Sometimes I lie awake at night thinking of the wonderful inventions and technologies that we might have in the world had women and minorities been able to play a full part in our scientific development. My hon. Friend gave the example of how, as Caroline Criado Perez said in her book, so much of our world has not reflected the needs or interests of women, which is really important. I say to the Minister: the agency, which we will come back to a number of times, will fail. It is designed to fail. When it fails—not in general, but particularly—it needs to have the support of the public to understand the reason why it failed. To lock women out of the board, which is what it will effectively do, and not reflect the importance of diversity, will be a factor in public trust.

10.30 am

This is entirely irrelevant to the amendment, but I noticed in the policy intent document published by the Secretary of State—I thought this was hilarious—the worked example for a programme director had women in it. The Minister knows that that worked example was not reflective of the proportion of principal investigators in our academic scientific and research establishment or indeed the mindset of the principal architect of the agency, Dominic Cummings, who, when asked at the Select Committee to suggest potential CEOs, found it very difficult to name a single woman.

The Government seem to be divided on this. They are paying lip service when it comes to talking the talk, but not reflecting the reality of the imperative that science reflect both the talents and the needs of women and the nation as a whole, which is what the amendment is designed to do.

I have a couple more quotes before I close. Professor Leyser of UK Research and Innovation told the Science and Technology Committee that

"we are interested in whether the organisations we fund are genuinely committed to, and engaged in, driving up equality, diversity and inclusion in their systems, by whatever mechanism, right across the range of protected, and indeed, unprotected characteristics....we are collecting these figures, so that we can track that the interventions we are making, which are substantial, are indeed driving up diversity....The way I view it is that high-quality research and innovation need diversity. You have to have people with different ideas and different backgrounds coming together to create the kind of environment where extraordinary things happen."

That is what we want for this agency. I hope we all believe that diversity is not a "nice to have"; it is an economic imperative that we need for the agency. The Minister must know that people tend to recruit people like them. That is how recruitment works, unfortunately.

People respect and admire the skills of those who look or talk like them, or went to the same school. We cannot allow this agency to be subject to that, because innovation, at its heart, needs diversity, and this agency is about innovation.

Finally, the Secretary of State for Business, Energy and Industrial Strategy told the Select Committee:

“One thing I learnt in my brief time as Secretary of State, talking to people like Steven Chu, Nobel prize-winning laureates, and really amazing and brilliant researchers, is that we need to have diversity. All the best researchers and the most innovative thinkers in this space will say that you have to have a diversity”, but not, apparently, on the board of ARIA.

With regard to the intervention made by my hon. Friend the Member for Cambridge, another example was the design of spacesuits for the NASA programme. When they had finally got round to having female astronauts, they realised that they had to delay a mission—I forget which one it was—because the spacesuits were designed for men. Do we really want to invest £800 million in an agency that addresses some great challenge but then forgets the importance of half of our population in meeting that challenge? I hope that the Minister will accept our amendment.

Amanda Solloway: I welcome the hon. Lady to her place.

This amendment concerns the appointment of ARIA's non-executive members by the Secretary of State. I have been lucky enough to speak to many outstanding women during my time as science Minister: scientists; researchers; and those with other important perspectives who would bring great expertise and value to the ARIA board.

This is an issue that I am committed to more broadly, as the hon. Lady will know, through developing a people and culture strategy that will look to ensure that the UK has the people we need at all levels, working in a culture that gets the best out of everyone and which delivers the best outcomes for the country. That means looking to remove barriers and dismantle any inequalities in the system that limit the ambitions, inclusion and participation of people from any background. I recognise the objective of the amendment and its importance, but I also highlight the inadvertent dangers of placing legislative constraints on the recruitment and appointment of ARIA's members.

However, I will emphasise for the hon. Lady the provision of the Equality Act 2010, as set out in schedule 3 of the Bill, which I am sure we will come on to discuss. ARIA will be subject to the public sector equality duty. This duty will also apply to appointments made to ARIA by the Secretary of State. That means seeking to advance equality of duty between those who share a protected characteristic and those who do not.

As the hon. Lady will be aware, protected characteristics include sex and gender reassignment, and I believe that this duty should place—as it was designed to do—important issues of gender equality on the appropriate legislative footing. Therefore, I hope that she recognises that there is no need to make any provision in the Bill, and will withdraw the amendment.

Amendment 9 also concerns the appointment of ARIA's non-executive members by the Secretary of State. In considering it, I will return to the Equality Act 2010, to which ARIA will be subject, and the public sector equality duty. As I have said, I believe that this duty should place, as it is been designed to do, the important

issue of inclusion and equality on an appropriate legislative footing. Appointments made by the Secretary of State will follow the governance code for public appointments. The code includes the following principle:

“Public appointments should reflect the diversity of the society in which we live and appointments should be made taking account of the need to appoint boards which include a balance of skills and backgrounds.”

I therefore hope that the hon. Lady recognises that there is no need to make any further provision in the Bill and will withdraw her amendment.

Kirsty Blackman: This has been quite an interesting debate and I particularly enjoyed the speech by the shadow Minister; I thought it was very good. However, I did not expect to be discussing women's underwear during the course of this Bill Committee.

It is the case in relation to things being designed for men that such things happen. We see that if we consider the fact that endometriosis treatments, for example, are few and far between, because researchers and organisations do not put money into researching things that are “women-only problems”, because for some reason we matter less. It is therefore incredibly important that the Government take positive steps in this regard.

Engineering and innovation will be the future for us. I have already said that I represent Aberdeen. We are looking at having a just transition; we are looking at moving Aberdeen away from its focus on oil and gas to a focus on renewable energy and the energies of the future. We will not have those energies of the future or the design and innovation that we will need unless we have diversity in the research environment and unless we have a significant number of people from different backgrounds, all with different life experiences, considering how best to solve problems. For young people considering coming into these organisations, having women and people with other protected characteristics on boards such as that of ARIA would mean that they are more likely to be able to aspire to those roles.

Stephen Metcalfe: I agree that we need to hold people up as examples to encourage people from far more diverse backgrounds to come into engineering and all STEM subjects. However, the amendment would mandate the percentage of women sitting on the board of ARIA. The UKRI board, with 13 members, has six women, without that being mandated and using the Equality Act 2010. The Equality Act is delivering our aims. Let us talk about how we get more people from diverse backgrounds into engineering. In my view, this is not the way to do it.

Kirsty Blackman: I thank the hon. Member for his input. I was not trying to criticise the actions of the UK Government in this area—in lots of other areas, but not in this one. Positive steps have been made. In Scotland, we have a duty of gender diversity on boards and it has worked. We have proved that it has worked across public sector boards. It has made a positive difference. People can say that we might not need to legislate for it, but it is a safeguard. It ensures that we have that percentage of women on the board and that we have diversity in all appointments in relation to ARIA.

Dawn Butler: I thank the hon. Member for her informative contribution, which I have found fascinating. It is great that UKRI has that diversity on its board

[Dawn Butler]

without it being mandated—I would suggest that that is another reason why ARIA and UKRI need to have a memorandum of understanding. Is it not important that there is some communication if that diversity is going to be taken into consideration? As the hon. Member says, if it is not mandated, we are just relying on good faith.

Kirsty Blackman: I absolutely agree. This measure should be included in the Bill as a safeguard or a fallback—a failsafe. I appreciate the public sector equality duty exists, but that is not strong enough to give me comfort.

When women do engineering degrees, they get better degrees than men. They get a better class of degree—the statistics prove it. If we want the highest possible quality of people, from diverse backgrounds, pushing innovation forward and trying to, for example, make the renewable energy technologies of the future, we need to ensure diversity on the board and more widely in the staff of ARIA.

Chi Onwurah: I echo the disappointment of the hon. Member for Aberdeen North in the Minister’s response, who takes this issue very seriously. The architect of ARIA and the debate around it have focused very much on great individual minds of science, generally men, and how they should be left on their own to go off and discover new and exciting things. These amendments would send a really important message to the science community that ARIA is an inclusive agency and that, regardless of what some may have said or envisaged, this is about the whole of the United Kingdom. I would emphasise that we still have far, far to go to reflect diversity in the science community.

10.45 am

Question put, that the amendment be made.

The Committee divided: Ayes 6, Noes 9.

Division No. 3]

AYES

Blackman, Kirsty
Butler, Dawn
Flynn, Stephen

Furniss, Gill
Onwurah, Chi
Zeichner, Daniel

NOES

Baker, Duncan
Bell, Aaron
Crosbie, Virginia
Fletcher, Mark
Hunt, Jane

Mayhew, Jerome
Metcalf, Stephen
Solloway, Amanda
Tomlinson, Michael

Question accordingly negatived.

Stephen Flynn: I beg to move amendment 31 in schedule 1, page 6, line 22, at end, insert—

“(3A) The Secretary of State may not appoint a person as chair unless the appointment of that person has been approved by resolution of each House of Parliament.

(3B) ARIA may not exercise any functions under this or any other Act, nor may the Secretary of State make any grants to ARIA under section 4 of this Act, until its first chair has been appointed.”

This amendment requires both Houses of Parliament, under the affirmative resolution procedure, to approve the name of the proposed Chair. ARIA may not exercise any functions, nor may the Secretary of State make any grants to ARIA until its first chair has been appointed.

The Chair: With this it will be convenient to discuss the following:

Amendment 10 in schedule 1, page 6, line 26, at end insert

“with the consent of the Science and Technology Select Committee of the House of Commons.”

This amendment would require that the Secretary of State seeks and obtains the consent of the Science and Technology Committee of the House of Commons for the appointment of ARIA’s first Chief Executive Officer.

Amendment 33 in schedule 1, page 6, line 26, at end insert

“(1A) The Secretary of State may not appoint a person as Chief Executive Officer unless the appointment of the person has been approved by resolution of each House of Parliament.

(1B) ARIA may not exercise any functions under this or any other Act, nor may the Secretary of State make any grants to ARIA under section 4 of this Act, until its first Chief Executive Officer has been appointed.”

This amendment requires both Houses of Parliament, under the affirmative resolution procedure, to approve the name of the proposed Chief Executive Officer. ARIA may not exercise any functions, nor may the Secretary of State make any grants to ARIA until its first Chief Executive Officer has been appointed.

Amendment 32, in clause 4, page 2, line 21, at beginning insert

“Subject to paragraph 2(3B) of Schedule 1,”.

This amendment is consequential to Amendment 31.

Amendment 34, in clause 4, page 2, line 21, at beginning insert

“Subject to paragraph 3(1B) of Schedule 1,”.

This amendment is consequential to Amendment 33.

Stephen Flynn: I would like to echo, first and briefly, the sentiments of my colleague in thanking the Clerks for their diligent work in the run-up to this Bill Committee and also to thank all of the witnesses who came to the evidence session last week. I found it incredibly informative and the hon. Member for Cambridge was right to highlight that at the start of today’s proceedings.

Amendment 31 and those related to it are quite simple. To coin a phrase that is oft used by Conservative Members, it is a way for this place to take back control. It is not a phrase that I would use willingly too often, for fear of sounding like them, but in this regard, it is a good way of summarising what is in front of us. It comes back to a key theme that runs through everything to do with ARIA and this entire concept. The hon. Member for Cambridge touched on it in respect of clarity. What is the Bill seeking to achieve? What is going to be the mission and the focus?

We heard during the evidence session that much of that determination of what the Bill seeks to achieve and the direction it takes is going to default to the chair, the CEO and those who are involved. They are going to fill the vacuum that the Government are leaving. That is fine, I assume, from the Government’s perspective, but it is incumbent on us as Members of this place, who are presiding over a significant amount of public money, to have a keen interest in what ARIA is seeking to achieve. The best and a very simple way we can do that is to ensure we have a chair and a CEO in place who we feel are pointing in the right direction. That is an important point to make, because—I am loath to mention him—

Dominic Cummings in his evidence session and in the public domain has ties with people whose views are questionable, to say the least. I say “ties”, but he referenced scientists who promote the likes of eugenics and we need to be mindful of these things and that there are people out there who have views that are abhorrent. We do not know who the chair is going to be. We do not know who the CEO is going to be. We can trust the judgment of the Secretary of State or we can all play a part in deciding that. It is incumbent on all of us when we are talking about such a significant amount of public money to do our duty: to take back control and make sure ARIA has the direction that it requires.

Chi Onwurah: Amendment 10, which stands in my name and that of my hon. Friends, reflects many of the concerns articulated by the SNP spokesperson—the hon. Member for Aberdeen South—and would require the Secretary of State to seek and obtain the consent of the Science and Technology Committee of the House of Commons to the appointment of ARIA’s first chief executive officer. Some members of the Bill Committee serve on the Select Committee and know how well able the Science and Technology Committee is to hold to account the potential—future—CEO of ARIA.

I feel that this amendment is particularly important because, in a response to a parliamentary question that I received just yesterday, the Minister made it clear that the recruitment of the first CEO was under way and that no interim CEO would be appointed. We therefore need to ensure that we get the first CEO right.

The driving factor behind the amendment is the need for greater oversight and responsibility. We are in the midst of a crisis of confidence; a scandal of sleaze is overwhelming this House and many of its institutions. I will start with a quote:

“The lunches, the hospitality, the quiet word in your ear, the ex-ministers and ex-advisers for hire, helping big business find the right way to get its way.”

That is how former Prime Minister David Cameron described back in 2010 the next big scandal to hit British politics. I want all members of this Bill Committee to think long and hard about the way the Bill is currently drafted. It leaves £800 million of taxpayers’ money, and our scientific future, open to just that level of sleaze.

We see in the current cronyism scandal the consequences of placing power and responsibility in the hands of those who are not accountable and do not have the moral judgment to hold that power wisely in the public interest. This Bill places huge power and responsibility in the hands of the CEO of ARIA, with little ongoing accountability, a significant budget and none of the checks provided by the usual public procurement and freedom of information rules. It is critical that there be parliamentary oversight of the choice of CEO if we are to avoid both sleaze and, equally important, the appearance of sleaze. This CEO needs the confidence of the UK’s scientific community: they will have a huge challenge. But they will receive that confidence only if they are appointed on merit. The Bill was drafted before the current sleaze scandal and reflects far too much the “Ask no questions—that’s too much bureaucracy” approach. We see where that has got us.

Labour’s Opposition day debate on 14 April, just last week, highlighted the fact that the Greensill scandal is just the tip of the iceberg of the cronyism rife in the

Conservative party during the pandemic and long before. It is laced through the billions of pounds-worth of contracts paid for by taxpayers and of a slew of troubling senior appointments.

Bill Committee testimony from Government witnesses such as Professor Philip Bond, and Dominic Cummings’ evidence earlier to the Science and Technology Committee contained multiple references to trusting the leaders of ARIA with £800 million of taxpayers’ money with no purpose or mission, none of the usual safeguards and complete freedom for the Secretary of State as to whom they appoint. We are concerned that this is a recipe for sleaze in science. There is no detail in the Bill—

Stephen Metcalfe: I am listening very closely to what the hon. Lady is saying, but I cannot imagine for one moment—I am sure that she cannot, either—that a chair or chief executive of ARIA would refuse an invitation from the Select Committee on Science and Technology to attend and answer questions. In the 11 years that I have been here, I have not been aware of a single incident of someone from the science community refusing to attend the Committee. To suggest that this could be science sleaze in the waiting is stretching the point way beyond reality.

Chi Onwurah: I am always grateful for the hon. Gentleman’s interventions, as he makes interesting—if inaccurate, in this case—points. Let me emphasise how it looks from the outside right now: we have all these friends getting contracts because they have the WhatsApp contact of the Secretary of State, and people appointed to be in charge of procurement also work for big producers. I am afraid that the Bill does not contain the necessary safeguards, and it is incumbent on the Committee to ensure that that kind of sleaze does not taint science.

Aaron Bell: One of the reasons why things look that way from the outside is the accusations made by the Opposition. I have an example. The hon. Lady was not here earlier—I completely accept that she had a reason for that—when I referred to Kate Bingham’s appointment, and the £670,000 spent last year on a crucial campaign to get hard-to-reach groups not only to take part in vaccine trials but to take the vaccine. At the time, the Leader of the Opposition said:

“You cannot justify that sort of money being spent”,

and the deputy leader of the Labour party said, “This cronyism stinks.” After what we saw last year, I think it a little rich of the Opposition to go round suggesting that this is the problem, when, as my hon. Friend the Member for South Basildon and East Thurrock said, the Science and Technology Committee, and all the science community, are very engaged. The idea that there would be scientific sleaze is frankly risible.

Dawn Butler *rose*—

Chi Onwurah: Before I give way to my hon. Friend or address the latest intervention, I will finish addressing one of the points made by the hon. Member for South Basildon and East Thurrock. He said that he could not imagine that any chair or CEO of ARIA would not agree to give evidence to the Science and Technology Committee. I remind him that Dominic Cummings,

[Chi Onwurah]

who was not the chair of ARIA but was certainly its chief architect, refused to give evidence to this Committee on the basis that he had already given evidence to another Committee, and once was enough in terms of accountability.

Jane Hunt: Will the hon. Lady give way?

Chi Onwurah: Let me deal with the previous interventions, to which I am currently trying to respond. The hon. Member for South Basildon and East Thurrock says that he cannot imagine such a circumstance, but I want undeniable accountability written through the Bill. I am concerned about the level of accountability in the Bill, and in some of the evidence, and in other discussion on the Bill, it has been suggested that accountability is a good thing, because that bureaucracy prevents people getting their own way. Perhaps the CEO might feel that they have better things to do than be accountable. In addition, this is about making the appointment of the CEO subject to the scrutiny of the Science and Technology Committee. What could be wrong with that?

As for the intervention from the hon. Member for Newcastle-under-Lyme, it is the first time that I have heard *The Telegraph* called the Opposition. The charges of sleaze are far broader than those coming from the Labour party. Indeed, it really cannot be said that we have led the charge when it comes to concerns about multiple examples of sleaze. I was really interested in the vaccine taskforce example that the hon. Gentleman gave. I congratulate the vaccine taskforce, and indeed the NHS. It is interesting that it is never called the “NHS vaccine roll-out” but we do talk about NHS Test and Trace, when the NHS is rolling out the vaccine much more than it is testing and tracing.

I asked about that £650,000 funding at parliamentary questions, and it did not go towards finding hard-to-reach groups—I will write to the hon. Gentleman with the response. It may have gone to good purposes, but to argue that it was for hard-to-reach groups is to take accountability away from that expenditure. That is worthy of criticism.

11 am

Dawn Butler: The Government are going to extraordinary lengths to avoid scrutiny. We have seen that time and again, from the closing down of Parliament to awarding themselves Henry VIII powers. The Science and Technology Committee, on which I and the hon. Member for Newcastle-under-Lyme sit, is a good Committee that comes up with good results. We are, in the main, collegiate and work together in the name of science and its progress. It is not unusual for appointments to flow through the Science and Technology Committee—that is how Parliament works—so the amendment is not asking for something extraordinary. It is saying, “Let’s continue what we do in Parliament on scrutiny and oversight.” I fail to understand why the Government are so opposed to any form of scrutiny on ARIA.

The hon. Member for Newcastle-under-Lyme says that people outside may be thinking about sleaze because of what the Opposition are doing. I disagree. They are understanding sleaze because of what the Government are doing, what the Good Law Project is doing in taking

the Government to court and what *Byline Times* and other investigative journalists are doing in highlighting the cronyism and corruption. If the Bill is to go through, we need to ensure that those allegations are not levelled at it, because we do not want sleaze in science. That is the last thing we need.

Jane Hunt: I have two points. First, UKRI is not broken. It is a great service that offers, through a process of application, grants and so on, a means to research and development. What ARIA does is create an opportunity for exceptional brains to make exceptional decisions and, with some money behind them, to try to develop things. It is not underhand or any of the things being said; it is just an opening and an opportunity. Someone said the other day that the coders in their bedrooms, who do not have the resources to make bids or applications, nor the language behind them to be successful, can get into that system. UKRI is not broken; ARIA is something separate.

With absolutely the greatest respect to the hon. Member for Newcastle upon Tyne Central, who was not here at the beginning, for good reasons, a number of Opposition Members have referred to Dominic Cummings. I am sorry, but I am not happy about that; we have before us a highly respected female Minister putting forward the Bill. We should respect her and her position and stop referring to somebody unelected who is not even in the room.

Chi Onwurah: There were a number of important interventions. Let me first respond to my hon. Friend the Member for Brent Central. She was right and did well to remind us of the normalcy of the Science and Technology Committee looking at important science appointments and how eminently qualified the Committee is to do that. I referred somewhat light-heartedly to *The Telegraph* not being the Opposition. She did well to remind us that important elements of the sleaze scandals—plural—that are circulating were discovered by investigative journalism of the highest quality, sometimes outside the mainstream press, which is not often appropriately and adequately supported on access.

On the hon. Member for Loughborough’s intervention, first, it is not the Opposition who are saying that UKRI is broken. She does not like my mentioning Dominic Cummings, but I must say that he and others have criticised UKRI and the existing science establishment. Let us remind ourselves that UKRI is only three years old, but they have criticised it as inadequate and argued for the creation of something that is not subject to huge bureaucracy. She claims that this will not be a barrier to the great coder in their garage who has some fantastic idea.

We are trying to prevent ARIA from being used simply by those in the know who have connections. That great coder in their garage is unlikely to know who to apply to for an ARIA grant or prize and will not have the connections to get to the front of the queue. I am sure that the Minister has considered that sometimes bureaucracy is about ensuring equality of access and opportunity. ARIA wants to move fast, and we recognise that, but it needs to ensure that the right accountability and confidence are in place. As other hon. Members have emphasised, we cannot allow the kind of sleaze we have seen elsewhere, particularly with regard to procurement

during the pandemic. We cannot allow that in science. I will not allow it to stain our great scientific heritage and hope for the future.

I have mentioned the Minister's interest a number of times. I hold her in the greatest respect, but she is very misplaced in her argument that I am somehow discriminating against her by referring to the self-vaunted architect of ARIA—he made that much clear during his Select Committee evidence, and he implied that it was one of the conditions for his becoming the Prime Minister's chief adviser—and to the antecedents of the agency that this Bill is about. That does her credibility no favours.

Let me continue. I am happy to take interventions, although I imagine that the Whips would like us to make progress. With none of the usual safeguards, and with complete freedom for the Secretary of State appointed by the Government, we are concerned that this is a recipe for sleaze in science. There is no detail in the Bill—perhaps the Minister could think about how to approve this—about who, if anyone, will play a role in making or scrutinising the appointments of chair, non-executive members and the first chief executive officer. There must be a concern about cronyism and protecting ARIA's independence.

Let me consider a point made earlier. We do not know whether the roles of the chair and chief executive of ARIA will be added to the schedule of the Public Appointments Order in Council so that they can be independently regulated by the Commissioner for Public Appointments. If the answer is yes, I would appreciate clarity. Will the significant appointments to the roles of chair and chief executive of ARIA require a senior independent panel member, approved by the commissioner, to sit on the advisory assessment process? If not, how will the Secretary of State ensure a fair and open-minded recruitment process for those positions?

The public are frankly tired of backroom deals between mates who go to the same pub. I want the CEO to have a transformative impact on British society. It is right that at least their appointment should be subject to public scrutiny. There has been much criticism of the revolving door between the public and private sector. We want ARIA to be above such criticism. Let us not allow it to become mired in grubby deals before it has even begun.

Some might say that the Government are taking a rather Stalinist approach to scientific research, where a small group of really smart men, as it always was, are left to decide how best to pursue socioeconomic projects. That is a model that basically entrusts resources to a small group of experts, without democratic oversight. I thought the other side were not over-enamoured with experts. If a Labour Government had done that, one suspects they would have had to face comparison to some of the USSR's leaders.

I emphasise that I do not believe that the Minister is subject to groupthink, and I am sure, or at least I hope, that the Secretary of State would never compromise himself in the way that the Conservative ex-Prime Minister David Cameron has, by giving jobs to buddies, but the fact is that people recruit people like themselves. Surely we need broader input. Dominic Cummings said in his evidence to the Science and Technology Committee that

the agency should have “extreme freedom”. The very least we should expect is that Parliament should be able to scrutinise the appointment.

To emphasise that our concerns are credible and legitimate, I point the Committee to supporting points made in evidence. Dame Ottoline Leyser from UKRI said:

“The whole ability of this organisation to operate in this edge-of-the-edge really visionary way that we are all very excited about is critically dependent on those people; and they are in very short supply.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 8, Q4.]

She added that

“it is crucial for the success of ARIA—it is everything. We need to go into the search process with absolute resolve to wait until we find the right people, and not appoint people just because there is a vacancy.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 16, Q13.]

On the mission, Professor James Wilsdon said that “in relying on appointing the leadership as the route to answering the question, all you do is move the source of the problem.”

That is why the amendment is so important. The Government are not taking responsibility for the mission, so the mission is with the chief executive officer. Surely the CEO must have some accountability. As Professor Wilsdon went on to say:

“If the Government have not been able to resolve the question of what it is for, how do we identify who the right leaders are?...I don't see how you can find the right people. If you do find people, how do you avoid it simply becoming a tool, a plaything, of their prior interests and priorities?”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 19, Q16.]

The Science and Technology Committee could investigate prior interests and priorities.

We heard from Professor Philip Bond that he is

“a big believer in giving the chair and the director enormous amounts of autonomy. You pick people you are willing to bet on and then hand them a lot of trust.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 25, Q20.]

We are agreed that the Bill hands a lot of trust to the CEO, without making them accountable to Parliament or the public.

Finally, I want to quote from ARIA's statement of policy intent:

“In shaping the research, culture, and setup of ARIA, the first CEO will have a significant effect on the technological and strategic capabilities of the UK over the course of generations. They will establish the philosophies, working styles, and cultural norms that make ARIA effective and distinct. They will recruit the first cohort of Programme Managers...enable them to launch the first programmes, sign the first research partnerships, and help define the strategic advantages the programmes aim for. They will position ARIA as a distinctive part of the UK's research funding landscape that complements and expands the UK's funding capability.”

Given the importance of the role, as clearly set out in that statement, to the science and technology landscape of this country, how can the Minister refuse to allow the Science and Technology Committee to have a role in that appointment?

11.15 am

Amanda Solloway: Amendment 10 would require the Secretary of State to seek the consent of the Science and Technology Committee before appointing ARIA's

[Amanda Solloway]

first CEO. Amendments 31 to 34 would require the proposed chair and CEO of ARIA to be approved by both Houses through secondary legislation.

These amendments reflect the welcome interest across Parliament in ARIA and the recognition that the agency's success is dependent on the right leadership, as has been mentioned. In regard to the amendments, there is no equivalent precedent, such as in the case of UK Research and Innovation. As such, we will soon launch a robust recruitment process and have designed it such that only the very best candidates will be appointed as ARIA's first CEO and chair. An experienced and expert panel will be responsible for sifting and interviewing candidates. It will feature the Government's chief scientific adviser Sir Patrick Vallance and Jo Shanmugalingam, who is director general for science, innovation and growth at the Department for Business, Energy and Industrial Strategy. They will be accompanied by two highly esteemed panellists from the international R&D community, whose names will be announced in due course. The final appointments will be made by the Secretary of State, who will continue to have responsibility for appointing non-executives, including future chairs.

The chair, in consultation with other non-executive members, will appoint future executives, including CEOs. Last week, Philip Bond told us that

"if you want to define the ARPA model at some level, it is this: it is a different model of trust."—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 25, Q20]

We trust the chair to make, in consultation with other non-executive members, appointments to the executive board. Placing additional limitations on that would, therefore, be contrary to the important principle of ARIA's operation. Of course, the Select Committee will be able to call on ARIA's leadership, to take evidence and understand their vision for the role. That point was made by the Secretary of State when he appeared before the Committee on 17 March. I therefore think that the process is open, fair and robust. It is completely sufficient for finding the right people.

Daniel Zeichner: Surely there is a fundamental point here about the relationship between Government and Parliament, and exactly the same point could be made about every single kind of appointment. This is a power grab by Government. The Science and Technology Committee would behave perfectly properly in making any kind of assessment. Why are the Government attacking Parliament in this way?

Amanda Solloway: As I previously explained, there is no precedent in the system. We will be recruiting in the same way as we do for UKRI, and it does not go into legislation. I am very confident that we will have a full and robust process for appointing the chief executive. I therefore think that this is an open, fair and robust process. It is completely sufficient for finding the right people to be the chair and chief exec of ARIA and to make it a success. As such, I hope that the amendment will be withdrawn.

Stephen Flynn: I want briefly to reflect on a couple of the Minister's remarks. She has twice referred to the fact that there is, of course, no precedent to what has been

suggested and used UKRI as an example. However, it is possible to make freedom of information requests of UKRI, and the organisation is subject to public contract auditors, so the comparison is not fair or just. I respectfully suggest to the Minister that it is apples and oranges, and I think she needs to reflect on that

The Minister also said that she does not want to infringe on the principle of ARIA. What about the principle of scrutiny? What about the principle of Parliament playing its role in that process? Does that mean nothing to the Government? The hon. Member for Cambridge hit the nail firmly on the head with his final comments. The relationship between Government and Parliament is an important one, and I find it utterly bizarre, as I said earlier, that a group of MPs who were all elected on a platform of taking back control are so happy to give it away to a single individual. Surely they can all see how utterly bizarre that is, and how the public will reflect on that with complete and utter dismay.

I will reflect briefly on the debate. I am sure that many of the points will be raised again later, particularly in relation to FOI, public contracts and the sleaze in which the Government are obviously enveloped. I have to admire the courage of the hon. Member for Newcastle-under-Lyme, who has tried incredibly hard to defend the Government. I would suggest that perhaps he is trying to defend the indefensible. I am sure the Government Whip is incredibly impressed at the hon. Gentleman's hard work in that regard, but he needs to be mindful about how tone deaf he perhaps sounds.

The very notion from the hon. Member for Loughborough that we cannot mention Dominic Cummings, even though he is the architect of the Bill, is utterly absurd. Did she not watch his evidence?

Jane Hunt: My point was that Dominic Cummings has been mentioned very frequently, but when debating the previous amendment we talked about wanting to promote women and their status in society and in science. We have here a Science Minister, but we are not referring to her with respect; we are referring to somebody else. That is what I was talking about.

Stephen Flynn: I am glad that the hon. Lady has managed to make her point, but with all due respect, I do not think I, or indeed anyone, has impugned the Minister's capabilities in any way, shape or form. All we have done is reflect on why the Bill is here in the way it is. It was set up by an individual who only got the role of chief adviser to the Prime Minister on the basis that this would become a thing. She needs to be very mindful of that.

To go back to my initial point about why we have tabled these amendments, it is about the role of this Parliament. It will be of no surprise to anyone in this room that I do not hold this Parliament in much regard. I would be quite happy for the people of Scotland to not have MPs in this Parliament, but while the public in Scotland are contributing money to this Parliament, it should have a role in providing scrutiny.

Dawn Butler: As a member of the Science and Technology Committee, I can say with almost absolute certainty that its Chair would be in favour of having a say in who becomes the CEO of ARIA.

Stephen Flynn: The hon. Lady has certainly made her point very well. I will sum up, because I am conscious of time and the fact that everyone else is, too. We heard during the evidence sessions that we want someone who is cross-cutting and who is not the usual suspect. We want someone who is a divergent figure. Let us play a role in making sure that we get that person.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 9.

Division No. 4]

AYES

Blackman, Kirsty
Butler, Dawn
Flynn, Stephen

Furniss, Gill
Onwurah, Chi
Zeichner, Daniel

Baker, Duncan
Bell, Aaron
Crosbie, Virginia
Fletcher, Mark
Hunt, Jane

NOES

Mayhew, Jerome
Metcalf, Stephen
Solloway, Amanda
Tomlinson, Michael

Question accordingly negated.

The Chair: We are drawing to a close. I am mindful of the time—we have literally two minutes left—so we might as well end slightly early.

11.23 am

Adjourned till this day at Two o'clock.

PARLIAMENTARY DEBATES

HOUSE OF COMMONS
OFFICIAL REPORT
GENERAL COMMITTEES

Public Bill Committee

ADVANCED RESEARCH AND INVENTION AGENCY BILL

Fourth Sitting

Tuesday 20 April 2021

(Afternoon)

CONTENTS

SCHEDULE 1 agreed to.

CLAUSE 2 agreed to.

Adjourned till Thursday 22 April at half-past Eleven o'clock.

Written evidence reported to the House.

No proofs can be supplied. Corrections that Members suggest for the final version of the report should be clearly marked in a copy of the report—not telephoned—and must be received in the Editor's Room, House of Commons,

not later than

Saturday 24 April 2021

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The Committee consisted of the following Members:

Chairs: †JUDITH CUMMINS, MR PHILIP HOLLOBONE, ESTHER McVEY, DEREK TWIGG

- | | |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| † Baker, Duncan (<i>North Norfolk</i>) (Con) | † Onwurah, Chi (<i>Newcastle upon Tyne Central</i>) (Lab) |
| † Bell, Aaron (<i>Newcastle-under-Lyme</i>) (Con) | Owen, Sarah (<i>Luton North</i>) (Lab) |
| † Blackman, Kirsty (<i>Aberdeen North</i>) (SNP) | † Richardson, Angela (<i>Guildford</i>) (Con) |
| † Butler, Dawn (<i>Brent Central</i>) (Lab) | † Solloway, Amanda (<i>Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy</i>) |
| Crosbie, Virginia (<i>Ynys Môn</i>) (Con) | † Tomlinson, Michael (<i>Lord Commissioner of Her Majesty's Treasury</i>) |
| † Fletcher, Mark (<i>Bolsover</i>) (Con) | † Zeichner, Daniel (<i>Cambridge</i>) (Lab) |
| † Flynn, Stephen (<i>Aberdeen South</i>) (SNP) | |
| † Furniss, Gill (<i>Sheffield, Brightside and Hillsborough</i>) (Lab) | |
| † Hunt, Jane (<i>Loughborough</i>) (Con) | Sarah Ioannou, Seb Newman, <i>Committee Clerks</i> |
| † Mayhew, Jerome (<i>Broadland</i>) (Con) | |
| † Metcalfe, Stephen (<i>South Basildon and East Thurrock</i>) (Con) | † attended the Committee |

Public Bill Committee

Tuesday 20 April 2021

(Afternoon)

[JUDITH CUMMINS *in the Chair*]

Advanced Research and Invention Agency Bill

Schedule 1

THE ADVANCED RESEARCH AND INVENTION AGENCY

2 pm

Chi Onwurah (Newcastle upon Tyne Central) (Lab): I beg to move amendment 7, in schedule 1, page 6, line 24, at end insert—

“(5) The Secretary of State must, in appointing the members of ARIA, have regard to the desirability of the members (between them) having relevant experience.”

This amendment would require the Secretary of State to have regard to the (collective) relevant experience of ARIA's members when using their power of appointment.

The Chair: With this it will be convenient to discuss amendment 8, in schedule 1, page 6, line 24, at end insert—

“(5) The Secretary of State must, in appointing the members of ARIA, have regard to the desirability of the members including at least one person with relevant experience in relation to each of Wales, Scotland and Northern Ireland.

(6) In this section, ‘relevant experience’ means experience of one or more of the following—

- (a) the conduct of scientific research; and
- (b) the development or exploitation of scientific knowledge.”

This amendment would require the Secretary of State to have regard to the (collective) relevant experience of ARIA's members in the devolved nations when using their power of appointment.

Chi Onwurah: It is a pleasure, to serve under your chairmanship, Mrs Cummins, and to return to our deliberations on the Advanced Research and Invention Agency Bill.

Both amendments concern the diversity and characteristics of the members of the board of the Advanced Research and Invention Agency. We have heard repeatedly in our deliberations that the board has a significant amount of power and autonomy. In our view, it suffers from lack of oversight, which the amendments are designed to address.

Amendment 7 would require the Secretary of State to have regard to the collective experience of ARIA's members in the devolved nations when using the power of appointment. The Labour party believes that science can be an engine of progress for society, and that it needs to be by and for everyone, not a private cashpoint for the few. It is essential that everyone in each region of the UK benefits from the creation of ARIA.

The Government have made many levelling-up promises over the past 18 months, just as they have made many promises to support science, but it is reported that they are now on track to miss the R&D target spend of 2.4% of GDP, following the cuts to international science spend, which were debated in the Chamber this morning, and the failure to provide support to medical research charities during the pandemic, forcing them to make sweeping cuts. The Royal Society has said that the Government's actions, such as the cuts to overseas development aid and science, and the lack of clarity until the last moment about Horizon European science funding are undermining the ambition for the UK to be a science power. We do not want the people of this country to be short-changed by the Bill, when it comes to the levelling-up agenda.

Levelling up is not possible without utilising the skills and experience of all those who have extensive knowledge of scientific research and knowledge in each nation of the United Kingdom. Each of the devolved nations possesses subtle and significant differences in their research landscapes. Our amendment would require the Secretary of State to have regard to the relevant experience of ARIA members when making appointments. We cannot expect ARIA to function effectively for every area of the Union, if its key decision makers and knowledge base are restricted to one narrow region of England. I am sure the Minister agrees.

Labour recognises that, as does UK Research and Innovation. In November 2020, UKRI chairman Sir John Kingman told the Select Committee on Science and Technology:

“We have structures that involve regular consultation with the devolved Administrations and the funding agencies in the devolved Administrations.”

He also told the Committee that this good working relationship was in contradiction to the decision not to have board-level regional representation. He said:

“It was decided at the time that there should not be representatives of the devolved countries on the board. In practice, I would say that there are two members of the current board.”

As we see, UKRI has had to struggle against the lack of representation on its board, so let us make it official and clear from the beginning that ARIA is a national body. Research and development is a vital driver of growth, and we must utilise ARIA in each region and nation to unlock new markets and create jobs. We all want significant improvement in the way in which the benefits of research and development are shared across our nation, and we want those who contribute to it to come from all areas of our nation. I therefore hope the Minister welcomes amendment 7, which would ensure that.

In the evidence sessions, we heard about the importance of public service in attracting good people to the ARIA board. Tabitha Goldstaub, the co-founder of CognitionX and the chair of the AI Council, said:

“The most important thing is that I just kept hearing time and again from the community I spoke to, similarly to what the gentleman from DARPA said, that this is a time to serve. People really want to find a place to do research that saves people's lives, especially in the AI eco-system.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 52, Q50.]

That desire to serve should be reflected by ensuring that we have people from across our nation serving. That is why we are proposing amendment 7.

Amendment 8 would require the Secretary of State to have regard to the diversity of the board members, including the representation of those with protected characteristics. The points that we are raising here were discussed in a previous debate on the SNP amendment grouped with one of our amendments, so I will not reiterate them, but I expect it to be recognised that science has a diversity problem. We want ARIA not to exacerbate that but to send a clear message against it. We are not looking to set specific quotas for ARIA, but we want to send a clear message to the scientific community and ARIA's chief executive and chair, whoever they may be, that diversity is essential to successful scientific research. High-risk, high-reward research should not exclude women or representatives from across our nations and regions.

The Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy (Amanda Solloway): Amendment 7 concerns the Secretary of State's appointment of ARIA's non-executive members. I have spoken to many experts, scientists and researchers about the creation of ARIA over the past six months, and one thing that has been made crystal clear to me is how important finding the right people will be to ARIA's success. That point was reiterated to this Committee in the evidence session last Wednesday. The importance of finding the right people extends to ARIA's non-executive members, and Professor Bond offered a valuable perspective on that. He was clear that we need a balance on the board and that it should include radical thinkers and those with different backgrounds in academia and industry. I was struck by his advice that we should have a board that was, in his words "small" and "slightly unusual". That is an important point.

We are looking to foster a culture that takes big bets and pursues transformational ideas. We have heard over and over again how rare are the people who can do that. The difficulty in finding the mix of people to best support that activity means that we should impose as few constraints as possible and cast the net as widely as we can. That is a strong argument against placing inflexible legislative constraints on the background and experience of the limited number of people we are looking for before we have begun that process.

We will conduct robust appointment processes that will follow the governance code for public appointments. That code includes principles of fairness, merit, diversity and integrity, which speak to the intention of the amendment.

Daniel Zeichner (Cambridge) (Lab): Will that include weirdos and misfits?

Amanda Solloway: I can confirm that we are looking for incredible people; I have made that clear.

There is another area where we are in danger of over-engineering ARIA: in governance arrangements. Although I share the belief of the hon. Member for Newcastle upon Tyne Central that a well-balanced board will be important for ARIA, I also believe that there are sufficient incentives and processes to support that without any further legislative constraint. For that reason, I encourage the hon. Lady to withdraw the amendment.

Chi Onwurah: I thank the Minister for her response. Will she say whether there are any factors that the Secretary of State should consider when making these appointments? For example, schedule 9 to the Higher Education and Research Act 2017 establishes that the Secretary of State must consider the collective experience of the UKRI board when making appointments. Are there no factors that should be considered in the case of ARIA?

Amanda Solloway: As I said, we will have a really robust appointment process. All those things will be taken into account to get that incredibly special person that we need to lead ARIA.

Amendment 8 also concerns the appointment by the Secretary of State of ARIA's non-executive members. As I have said, I strongly believe that we should impose as few constraints as possible and cast the net as widely as we can in finding ARIA's members. There is a real risk that placing inflexible legislative constraints on the background and experience of that limited number of people we are looking for will hamper our ability to find the right person.

I do, however, recognise that it is important for ARIA to be fully connected to the outstanding R&D activity in Scotland, Wales and Northern Ireland. That will require ARIA to build strong partnerships with institutions and businesses in all four nations. I echo comments from elsewhere about the fundamental importance of relationship building to this activity, but it is not necessarily possible to legislate for that. In the recruitment for the CEO and chair, we will work with the devolved Administrations and stakeholders across the United Kingdom to broaden the search for potential candidates, to encourage geographic diversity from the outset of these discussions. That approach, seeking as far as possible to ensure that the pool of people considered for positions in ARIA is representative of the geographic diversity of the UK, is the right one. ARIA would ultimately not be served by extensive and specific requirements that limit the options. I therefore cannot accept the amendment.

Chi Onwurah: I thank the Minister for her response. We are hearing again that ARIA is not to be subject to regulation or oversight, regardless of what form that takes. The flexibility of which the Minister speaks can be seen by others as cronyism or the opportunity to ensure cronyism. The public are sick of mates being appointed without oversight. As I said in my intervention, other boards, such as the UKRI board, are required to consider the experience of the board before making further appointments. Would the Minister consider it acceptable if the entire board came from, say, Cornwall, which is not very representative, or had expertise only in nanotechnology? Cornwall is a very nice place and nanotechnology is an excellent scientific subject, but we heard from witnesses about the importance of having diversity of thought, background and experiences.

2.15 pm

The Minister says she is reluctant to place too strong constraints on the choice of the board, but it seems she is reluctant to place any constraints whatever, even given the need to include accountability, diversity and wide-ranging scientific experience and experience of the

regions. We tabled the amendments because we see other examples of organisations in the public sector that lack the necessary regional, national or gender representation or have other diversity issues.

Kirsty Blackman (Aberdeen North) (SNP): For the avoidance of doubt, we are happy to support the two amendments. On the issue of geographical experience, if we go with geographical knowledge as well, and perhaps get people who have specific expertise in, for example, energy-related technologies, such as we have around Aberdeen, and in technologies around AI, which we have in the area around Edinburgh, then we have geographic hubs as well as experience hubs. The amendment nicely allows for ARIA to make sure that it encapsulates all of that and not just, as the hon. Lady says, nanotechnology, which is brilliant but is not the only thing that we should focus on.

Chi Onwurah: I am in absolute agreement with the hon. Lady. She highlights an important issue. We want ARIA to be transformational. We heard the Minister underline that we want ARIA to transform real people's lives, but how is ARIA to do that if its members do not have experience on the ground in the different regions and nations of our country and if they do not understand the way in which the supply chain works in Aberdeen, for example, for specific technologies and sectors? We do not want ARIA to have a narrow focus or a narrow background of expertise. On that basis, I wish to press the amendment to a vote.

Question put, That the amendment be made.

The Committee divided: Ayes 5, Noes 9.

Division No. 5]

AYES

Blackman, Kirsty	Onwurah, Chi
Flynn, Stephen	
Furniss, Gill	Zeichner, Daniel

NOES

Baker, Duncan	Metcalfe, Stephen
Bell, Aaron	Richardson, Angela
Fletcher, Mark	Solloway, Amanda
Hunt, Jane	Tomlinson, Michael
Mayhew, Jerome	

Question accordingly negated.

Amendment proposed: 8, in schedule 1, page 6, line 24, at end insert—

“(5) The Secretary of State must, in appointing the members of ARIA, have regard to the desirability of the members including at least one person with relevant experience in relation to each of Wales, Scotland and Northern Ireland.

(6) In this section, ‘relevant experience’ means experience of one or more of the following—

- (a) the conduct of scientific research; and
- (b) the development or exploitation of scientific knowledge.”—(*Chi Onwurah.*)

This amendment would require the Secretary of State to have regard to the (collective) relevant experience of ARIA's members in the devolved nations when using their power of appointment.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 9.

Division No. 6]

Blackman, Kirsty	Furniss, Gill
Butler, Dawn	Onwurah, Chi
Flynn, Stephen	Zeichner, Daniel

AYES

NOES

Baker, Duncan	Metcalfe, Stephen
Bell, Aaron	Richardson, Angela
Fletcher, Mark	Solloway, Amanda
Hunt, Jane	Tomlinson, Michael
Mayhew, Jerome	

Question accordingly negated.

Amendment proposed: 10, in schedule 1, page 6, line 26, at end insert

“with the consent of the Science and Technology Select Committee of the House of Commons.”—(*Chi Onwurah.*)

This amendment would require that the Secretary of State seeks and obtains the consent of the Science and Technology Committee of the House of Commons for the appointment of ARIA's first Chief Executive Officer.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 9.

Division No. 7]

Blackman, Kirsty	Furniss, Gill
Butler, Dawn	Onwurah, Chi
Flynn, Stephen	Zeichner, Daniel

AYES

NOES

Baker, Duncan	Metcalfe, Stephen
Bell, Aaron	Richardson, Angela
Fletcher, Mark	Solloway, Amanda
Hunt, Jane	Tomlinson, Michael
Mayhew, Jerome	

Question accordingly negated.

Amendment proposed: 33, in schedule 1, page 6, line 26, at end insert—

“(1A) The Secretary of State may not appoint a person as Chief Executive Officer unless the appointment of the person has been approved by resolution of each House of Parliament.

(1B) ARIA may not exercise any functions under this or any other Act, nor may the Secretary of State make any grants to ARIA under section 4 of this Act, until its first Chief Executive Officer has been appointed.”—(*Stephen Flynn.*)

This amendment requires both Houses of Parliament, under the affirmative resolution procedure, to approve the name of the proposed Chief Executive Officer. ARIA may not exercise any functions, nor may the Secretary of State make any grants to ARIA until its first Chief Executive Officer has been appointed.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 9.

Division No. 8]

Blackman, Kirsty	Furniss, Gill
Butler, Dawn	Onwurah, Chi
Flynn, Stephen	Zeichner, Daniel

AYES

NOES

Baker, Duncan	Metcalf, Stephen
Bell, Aaron	Richardson, Angela
Fletcher, Mark	Solloway, Amanda
Hunt, Jane	Tomlinson, Michael
Mayhew, Jerome	

Question accordingly negated.

Chi Onwurah: I beg to move amendment 11, in schedule 1, page 6, line 31, leave out sub-paragraph 4 and insert—

“(4) The Secretary of State may refuse consent under sub-paragraph (3) only where the Secretary of State considers—

- (a) it necessary or expedient in the interests of national security, or
- (b) the person is unable or unfit to carry out the functions of the office.”

This amendment would allow the Secretary of State to refuse consent to the appointment of an executive member of ARIA on the basis of their unfitness or inability to carry out the functions of the office.

The Chair: With this it will be convenient to discuss amendment 12, in schedule 1, page 7, line 11, leave out sub-paragraph 2 and insert—

“(2) The Secretary of State may remove a person from office as an executive member if the Secretary of State considers—

- (a) it necessary or expedient in the interests of national security, or
- (b) the person is unable or unfit to carry out the functions of the office.”

This amendment would allow the Secretary of State to remove an executive member of ARIA on the basis of their unfitness or inability to carry out the functions of the office.

Chi Onwurah: I am not daunted by the 6:9 defeat that we have just experienced. We will continue in the hope of winning over Government Members to the improvements that we wish to see in the Bill. The amendments, which stand in my name and those of my hon. Friends, are just such constructive amendments to improve the Bill and, more specifically, to actually give the Secretary of State greater powers than he, perhaps in his modesty, has set out in the Bill.

Amendment 11 would allow the Secretary of State to refuse consent to the appointment of an executive member of ARIA on the basis of their unfitness or inability to carry out the functions of the office. Amendment 12 would allow the Secretary of State to remove an executive member of ARIA on the basis of their unfitness or inability to carry out the functions of the office. The amendments are necessary because greater oversight and responsibility are needed to avoid even the suggestion of the taint of sleaze being attached to science.

This morning, in response to amendment 10, through which we intended the Science and Technology Committee to review the appointment of the chief executive, I think the Minister said that we needed a different model of trust. The public need the existing models of trust to be upheld by our Parliament, our Ministers, our Executive, and the executives of agencies such as ARIA. It should also be clear that the Government are taking responsibility for who is on ARIA's board and has control of £800 million of public money and, more important, control of our scientific—and therefore economic—future.

The Bill places huge responsibility and power in the hands of ARIA's CEO with little ongoing accountability. The Secretary of State is responsible for appointing the chair, other non-executive members of the board, and the first CEO. All subsequent CEOs and all other executive board members will be appointed by the chair after consultation with the other non-executive members, as set out in paragraph 3(2) of schedule 1. Such appointments cannot be made without the consent of the Secretary of State, but as the Bill stands, the Secretary of State can refuse consent only on national security grounds. Why are national security grounds the only grounds on which somebody might not be fit or suitable to serve on the board of ARIA?

Dawn Butler (Brent Central) (Lab): Should other grounds, such as wanting to pursue eugenics in great depth, not be considered reasons not to appoint somebody to a board?

Chi Onwurah: My hon. Friend raises an important point. As we heard in earlier discussions, there are concerns about the areas of science, such as eugenics, that might be championed or accepted by potential board members. I would hope that belief in eugenics was sufficient to consider someone unfit for the board, but, as it stands, the Secretary of State would currently have no power to refuse consent for an appointment on that basis. I find it interesting to consider the workings of the Secretary of State's mind here. National security is clearly a critical issue, and it is the first duty of any Government to protect their citizens, but are there no other reasons why somebody might not be suitable?

2.30 pm

Daniel Zeichner: This is an opportunity; we can help spare the Government future embarrassment. Quite frankly, if we have this set of out-there people running the organisation and they then choose to appoint someone highly controversial, it could be extremely embarrassing. I remember occasions when Labour Secretaries of State had difficulties with scientific advisers. These are controversial areas, and I can foresee an extremely difficult situation. Without an ability to intervene, where does it lead?

Chi Onwurah: My hon. Friend makes an important point. It is important to understand that ARIA will be an independent agency, but it will be spending taxpayers' money and it will therefore reflect the public and the national interest. If somebody is recruited who, at the time or later on, is found to have views that are abhorrent to society, or not fit to serve on the board for other reasons, by what process could or would such a person be removed from the board? If, for example, after appointment of a member to the board, it was found that they championed eugenic research or that they believed in anti-vaccination mythologies, for example, would there be any means by which they could be removed?

Kirsty Blackman: Does the shadow Minister find it bizarre, as I do, that we have a higher bar for taxi drivers, for example, who have to pass a “fit and proper person” test in order to become a taxi driver, than for these people, who will be spending millions of pounds of public money? I recognise that that is a sensible thing to do, but there is not the level of oversight that we have for people such as taxi drivers.

Chi Onwurah: The hon. Lady makes a very good point on the comparison with a “fit and proper person” test for taxi drivers. That underlines the point I was going on to make. In the Bill, there is no statutory requirement for members of ARIA to possess scientific expertise or experience, whether individually or collectively. There is no floor—there is no minimum requirement—for their expertise. We have heard a lot about how wonderful and amazing and visionary they must be, but we have not heard about any floor for that expertise and, as I said earlier, there are no “have regard to” factors that the Secretary of State must consider when making appointments. Schedule 9 to the Higher Education and Research Act 2017, for example, establishes that the Secretary of State must consider the collective relevant experience of the UKRI board when making appointments. In this Bill, there is no floor. That is a huge concern for the Committee.

In the evidence session, Professor Philip Bond said:

“What you are doing in creating this kind of model is handing trust to people. You want people with high integrity who are brilliant, and then you let them get on with it, and you trust that they will do something that reflects their character.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 25, Q20.]

With the examples that we have seen of Tory cronyism, do the Committee really think that we can just rely on trust when it comes to public interest and the public purse?

Duncan Baker (North Norfolk) (Con): One of the fundamental roles of a director is to exercise reasonable care, skill and diligence. As that is part of the fundamental concept of a board, I would suggest it is the collective responsibility of the chief executive and the entire board, not the responsibility of the Secretary of State.

Chi Onwurah: The hon. Member makes an interesting point, and it would be excellent if we understood better how the board would collectively exercise responsibility. When we talk about a board exercising collective responsibility, that is absolutely true. That is right, and it is what happens in the private sector. I would be interested to know whether the reporting requirements on private sector boards will apply in this case, but this is public money. It is £800 million of public money—taxpayers’ money. Particularly as we come out of a pandemic and recession, there are many worthy recipients of that money. Is the hon. Member truly saying that it should be spent and directed by people who have no accountability and cannot be removed? The Secretary of State is responsible for their getting the money, but will have no ability to remove them, no matter how unfit they prove themselves to be. On the basis that the amendments offer the Secretary of State further powers to ensure the fitness of the board, I hope that the Minister will accept them.

Amanda Solloway: Amendment 11 would extend the right of the Secretary of State to refuse an executive member appointment to include refusal of consent where a person is

“unable or unfit to carry out the functions of the office.”

It is important that the Secretary of State’s refusal rights are limited to where it is necessary and expedient on national security grounds. The freedom for the chair to hire the executive leadership team is a key feature of

ARIA’s independence from Government. The Secretary of State will hire a top-quality non-executive team who have the experience and expertise to oversee ARIA. We should trust their judgment to hire an exemplary set of executive members. I remind the hon. Member for Newcastle upon Tyne Central that the Secretary of State will appoint the inaugural chief executive officer and will set the tone for the quality of the future executive member hired by the chair, and I hope she will withdraw her amendment on that basis.

I will now move to amendment 12, building on my comments with respect to amendment 11. Once appointed, the terms of employment for executive members’ contracts are determined by the chair, with the consent of the Secretary of State, and only after consulting other non-executive members. They are expected to include standard provisions that would allow the chair to remove an executive member from office if that person is deemed unfit or unable to carry out the functions of the office.

Chi Onwurah: I thank the Minister for her earlier comments. Can she clarify what she means when she says, “They are expected to include standard provisions”? Is she saying that they will include the explicit provision for the CEO and the chair to remove members, and under what criteria or circumstances?

Amanda Solloway: To reiterate, and building on my previous comments, contracts are determined by the chair. The contracts that people will have are to be negotiated. Furthermore, in extremis, the Secretary of State may remove the chair and other non-executive members if he or she is particularly concerned by the quality of executive members recruited by the chair. It is for those reasons that the amendment is not necessary, and I hope the hon. Lady will not press it.

Kirsty Blackman: We have asked an awful lot of questions about the appointment of the CEO and chair. Does the Minister understand that her answers have not given us comfort? To say that the roles will be appointed by the chair and the chief executive does not help us a huge amount, because we are not very happy about the process of appointing those people, so for them to be able to appoint other people does not help us in any way, shape or form. Having more safeguards in place would give us comfort that those people will be fit to do the job.

Chi Onwurah: I echo the point made by the hon. Member for Aberdeen North. We recognise that a significant amount of power lies in the chief executive and the chair, and there is no oversight from Parliament or others of those appointments. To say that the chief executive and the chair will have the power according to contractual negotiations to remove members does not reassure us. The Minister said that the Secretary of State could, in extremis, remove the chair. Would she write to me to set out what the in extremis circumstances would be?

I am keen not to detain the Committee unnecessarily. We are raising important matters, but since the Minister is not happy to accept them, I beg to ask leave to withdraw the amendment.

Amendment, by leave, withdrawn.

Chi Onwurah: I beg to move amendment 13, in schedule 1, page 9, line 11, leave out paragraph 11 and insert—

“11 The Secretary of State must by regulations make provision establishing the procedures to be adopted for dealing with conflicts of interest of members of ARIA, members of a committee or sub-committee or ARIA’s employees.”

The amendment seeks constructively to improve the Bill by providing greater transparency and oversight, and thus avoid potential scandals or sleaze that are currently overwhelming various aspects of this Government. The amendment would require that the Secretary of State make regulations to establish the procedures to deal with conflicts of interest involving ARIA’s members and staff. We recognise that ARIA should have close links with the private sector. ARIA will not be able to achieve its transformational goal without working closely with the private sector.

As was stated in the evidence sessions, part of the UK’s particular challenge is the commercialisation of existing fantastic ideas, so working closely with the private section is important. However, the Committee must be aware that we have seen time and again, particularly now, that the revolving door between the private and public sectors can be open to abuse, especially—I say reluctantly—under this Government. Only last weekend, writing in *The Observer*—other newspapers are available; I mentioned *The Daily Telegraph* earlier, so I am trying to be fair—the senior Conservative MP and Chair of the Liaison Committee, the hon. Member for Harwich and North Essex (Sir Bernard Jenkin) said:

“The line between public service and private gain is shamefully blurred”.

He went on to say:

“In the meantime, the government can establish not so much new rules but new processes and education, which encourage more of the proper conversations about values, integrity, ethics and how to behave when there might be potential, or even just perceived, conflicts of interest.”

He went on to recommend training in conflicts of interest. Again, we are constructively giving the Government—obviously the Bill was drafted before some of the scandals that they are embroiled in came to light—the opportunity to follow his advice.

2.45 pm

It is a standard approach internationally. The Defence Advanced Research Projects Agency, which is the inspiration for ARIA, has clear conflict of interest rules. In the evidence sessions, we heard from a number of witnesses whose evidence supports the amendment. Dr Peter Highnam, deputy director of DARPA in the US, made an excellent contribution. When discussing the ways in which ARIA might be able to invest in ideas, programmes, companies and so on, he said:

“Of those that you listed, the only one that we do not do is take investment positions in companies. That is not what we do. You can make a proposal to us for research. You may offer a cost-share, depending on whether it is a major company and very systems-oriented work, all the way to a standard research grant to a university or small business, or a combination of those things.”—[*Official Report, Advanced Research and Invention Public Bill Committee, 14 April 2021; c. 47, Q41.*]

He also said:

“I can speak only to how DARPA operates. We have very rigorous review processes—technical, financial and others. We have conflict of interest rules and so on that we all follow. There

are robust processes and independent looks at those processes. Again, we could not operate any other way.”—[*Official Report, Advanced Research and Invention Public Bill Committee, 14 April 2021; c. 38, Q29.*]

I highlight the fact that DARPA does not allow for the taking of equity interests in companies, yet still has much more rigorous conflict of interest rules—we have none—and a process of accountability that the Bill neglects. When I pressed Dr Highnam on whether programme directors, when they go back to the private sector, are allowed, for example, to direct finance at the companies to which they return, his response was quite clear and critical: “No.” We do not see any of those checks and balances in the Bill.

Aaron Bell (Newcastle-under-Lyme) (Con): Will the hon. Lady give way?

Chi Onwurah: I give way to the hon. Member for Newcastle-under-Lyme.

Aaron Bell: I thank the hon. Lady for the other Newcastle for giving way. She draws a comparison with DARPA, but is the more obvious comparison not with UKRI? Like ARIA, UKRI is bound by the code of conduct for board members of public bodies, which includes, for example, the obligation to declare publicly any private financial or non-financial interests that may, or may be perceived to, conflict with one’s public duty. That speaks to the point that my hon. Friend the Member for North Norfolk made: we would not expect the kind of people we will appoint to the board to act in the ways that she seems to think they will.

Chi Onwurah: I thank the hon. Member for the second Newcastle for that contribution. I will make a couple of points in response. Let me gently say that Government members of the Committee are trying somewhat to have it both ways, in saying that ARIA will be like UKRI while not putting in place any of the measures, systems or processes of accountability to require it to be like UKRI, building on the fact that ARIA is, as I understand it, meant to fill a gap in our research landscape.

On whether ARIA will follow all the rules that UKRI follows, I am pretty sure that the answer to that is no, because as I understand it, it is not going to follow freedom of information or procurement rules. We have seen over the past few months with the scandal over Greensill—this is what the comments from the Chair of the Liaison Committee were about—that the existing rules and regulations are not sufficient. Finally, for the hon. Member for Newcastle-under-Lyme to say that we can expect these people to behave better because they are going to be better than that—really? Many scandals have been founded on expectations like that and again, we do not want the touch or hint of scandal near our fantastic science base.

Jerome Mayhew (Broadland) (Con): Can I have some clarity from the hon. Lady? The point made by my hon. Friend the Member for Newcastle-under-Lyme—the other Newcastle—was that there is already a written requirement for members of these kinds of bodies to make full disclosure. If they are going to ignore that,

[Jerome Mayhew]

why does the hon. Lady think that they would not ignore a regulation from the Secretary of State saying exactly the same thing?

Chi Onwurah: I thank the hon. Member for his contribution, which I think was made in a constructive sense.

I think the Chair of the Liaison Committee is making a point about that guidance. Clearly, it was not sufficient for David Cameron and it is clearly not proving to be sufficient in other cases. I hope that, as this amendment sets out, it is not simply about declaring. This is a critical part and I am grateful to the hon. Gentleman for allowing me to emphasise it. The amendment does not say they should declare conflicts of interest; it states that the Secretary of States makes regulations—detailed, I would say—establishing the procedures to deal with conflicts of interest. That is the key thing. This stems from the need to have a close working relationship with the private sector, which will give rise to conflicts of interest that may be quite complex, especially with new and evolving technologies, which may go on to complex and potentially international supply chains. Those conflicts of interest may be complex, involving equity stakes and so on. We need procedures to deal with them that are more detailed than the current general ones and which are specifically targeted at ARIA's unique role.

Dr Regina Dugan, the chief executive officer of Wellcome Leap, effectively supported that proposal:

“The particular way that we work is through contracts; we do not actually do grants. I also think that this position of not taking equity is important, because the non-profit element of it is part of the differentiation, and we have an entire commercial sector that is good at assessing value and figuring out return on investment.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 48, Q43.]

What is different with ARIA is that it is, potentially, going to be taking equity, which can raise more complex conflicts of interest.

Professor Pierre Azoulay of the Massachusetts Institute of Technology said that

“the programme managers at DARPA and also at ARPA-E—the Advanced Research Projects Agency-Energy—have a fixed expiration date, which means they will need to go back to academia or to the venture capital firm or large firm that they left, and generally they want to do so with their head held high and their reputation intact. I think that that has created over time a norm of correct behaviour, if you will, and the absence of cronyism.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 38, Q30.]

We want to see that norm of correct behaviour established through supporting processes and procedures. I asked Dr Highnam,

“What should we be looking for in the directors and programme managers as the key positive part of the culture that ARIA should seek to build?”

He answered:

“Honour in public service is top of the list.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 39, Q32.]

I should say that I have not heard any Government witness or Minister emphasise the importance of honour as a key characteristic of board members. I think it is really important that procedures to deal with conflicts of interest are established. That view is shared by the Chair of the Liaison Committee, who has said

“After the dust settles over the Greensill affair, I suspect that we will find that the lack of judgment over David Cameron's approaches to ministers is less important than the general failure to address what has become a casual approach to conflicts of interests amongst many in government and in politics...All can see now the general inability of the various codes and systems”—to the points made—

“of oversight, such as the toothless advisory committee on business appointments, to provide sufficient transparency and accountability, which is why even its chair, Lord Pickles, wants reform.”

When the Chair of Liaison Committee, who is much respected on the Government Benches, says that, and when we are mired in scandals as a consequence of a lack of appropriate conduct and clear processes and procedures, I urge the Minister to accept the need at the very least for greater detail when it comes to avoidance of conflicts of interest. I urge her to accept the amendment to establish processes and procedures to avoid conflicts of interest in this new body, which is critical to our future economic and scientific prosperity.

Daniel Zeichner: It is a pleasure to be part of a Committee that you are chairing, Mrs Cummins. I fully endorse what my hon. Friend has said about the amendment. In fact, she has pretty much said it all, but there are one or two points that I want to add.

We are considering a profound set of issues. The evidence sessions showed some fundamental differences in culture between our country and the Americans, and it is their example on which we are largely modelling our initiative. To some extent it goes to the problem that we are facing as a country at the moment. For a long time, we rather considered ourselves not to be prey to such conflicts; we had a British way of doing it. Procedures were not necessarily written down, but there were understandings and people behaved properly. The sad truth is that over the past 20 to 30 years, somewhere that changed. That is the truth, and that is why we are in the current situation.

In the evidence session with the Americans, I was very struck at one point when we were pressing them on how they avoided conflicts of interest. Their response was a kind of American swelling of patriotic pride, as they said that they would not do that because it would somehow harm the American dream. [*Interruption.*] Exactly. People in Britain are different; it is not that we are not proud of our country or patriotic, but I would say that our patriotism is different from theirs.

Chi Onwurah: My hon. Friend makes an important point. Perhaps the fact that DARPA is part of the US defence establishment, with all the military honour and commitment to the defence of the nation, is one of the reasons why honour was held so high by the Americans. Does he agree that the absence of any mission and any departmental ownership of ARIA means that will not be the case in the UK?

Daniel Zeichner: My hon. Friend has touched on a very important point. It was something that I tried to draw out in some of the evidence sessions. I would point Members to an excellent book written a few years ago by Lord Sainsbury, an esteemed former science Minister. He talked about the differences in culture between Europe, America and the UK, and warned against just

trying to transpose one system to another, unless one really understood the cultural context. We have not mentioned it so far today, as it has very much been about natural sciences and perhaps, *mea culpa*, engineering at the beginning, but the social sciences may be biggest challenge of all. That was touched on at one point in the evidence sessions when one of the witnesses said it is not just a matter of the technologies, but public acceptance and understanding of them. It will require some really innovative work from social scientists to understand how that will work.

3 pm

Taking the system that works in America as an example, it was originally rooted in the defence establishment—exactly as my hon. Friend says—which gave it very strong principles and values. Again, there was a moment in the evidence session when we could feel people smiling, because in the current context the idea that honour and public duty will protect us against the dangers of conflicts of interest seems slightly fanciful, frankly. Government Members are understandably rallying to their side's cause in the Bill as drafted, but in the current public context, surely we should want to include more safeguards, to make it clearer to everyone what is expected and to give more opportunities to protect ourselves against future problems.

As the shadow Minister and others have said, we know that this is a very delicate and complicated set of relationships between people working in the public sector and in private companies. I represent Cambridge, where we have deliberately sought to put public bodies such as the Laboratory of Molecular Biology adjacent to AstraZeneca, because we know that there is a constant interchange of ideas. That is how innovation works: people meeting each other. We then have to be really careful, however, otherwise we will end up with the charge—rightly made in some cases—that huge amounts of public money go into developing research, and then, lo and behold, the public pay again when they have to buy those products back from the private sector, which has used that public sector-based research to make the product.

I fully and absolutely understand why money is needed to go into research, but there is a real risk that in future we will lose public support, which is why it is so important that we get these things right. I would just caution that, in a few years' time, the Government—not necessarily this Government; hopefully, my Government—might find themselves wanting to deal with dodgy advisers, and I want us to ensure that we have the mechanisms to deal with that. This Government are leaving themselves open to some real risks, because they are putting themselves in a position where they do not have the tools to hold to account people who sometimes may not quite be what they first seemed.

Amanda Solloway: On amendment 13, the framework document to be agreed between the Department for Business, Energy and Industrial Strategy and ARIA, which will complement the Bill, will commit ARIA to the code of conduct for board members of public bodies, which sets out the personal and professional standards expected from board members, and forms part of individual members' terms and conditions of appointment.

The code of conduct includes, for example, the obligation to declare publicly any private financial or non-financial interests that may, or may be perceived to, conflict with one's public duty. I believe that that principle-led, non-legislative approach is appropriate. Indeed, it is the standard approach taken by many other arm's length Government bodies, including UKRI. That approach allows ARIA to manage conflict of interest risks in a flexible way that is best suited to its operations.

I agree wholeheartedly with what Dr Peter Highnam said last week about what we should be looking for in the CEO to build the right ARIA culture:

“Honour in public service is top of the list.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee, 14 April 2021; c. 39, Q32.*]

We will instil that sentiment in ARIA from the outset, starting with the recruitment of the chair and the CEO. We also have an additional assurance, in that the Bill includes a reserved power to introduce additional procedure, in law, should that be necessary once ARIA is operational. I believe that the hon. Member for Newcastle upon Tyne Central should take great comfort in the reserved power set out in paragraph 11, and I ask her to withdraw the amendment.

Chi Onwurah: I thank the Minister for her response. I take most comfort from her unequivocal statement that honour in public service is a key characteristic that will be looked for in the chief executive officer of ARIA, because I had not heard such a strong statement about the need for honour, or even for public service, in ARIA's mission. I take more comfort from that than from the confirmation that ARIA board members will be subject to existing rules about conflicts of interest. As we have heard, those rules are not sufficient. For example, in one of the recent scandals it was found that the Secretary of State for Health and Social Care owned shares in a company that had received a significant contract from his Department, and there were questions about whether the requirements for declarations of public interest had been met.

We in the Opposition have said a number of times that ARIA is an organisation that will necessarily give rise to important conflicts of interest, so it needs more detailed procedures and processes. I do not want to detain the Committee, however, and I hope that the Minister will look at the issue in the future. I will not push the matter to a vote, so I beg to ask leave to withdraw the amendment.

Amendment, by leave, withdrawn.

Chi Onwurah: I beg to move amendment 14, in schedule 1, page 10, line 5, at end insert—

“(3) The report shall contain information regarding—

- (a) the proportion of ARIA's funding in the relevant financial year which has financed activities taking place (in whole or in part) outside the United Kingdom, and
- (b) the national and regional distribution of activities in the United Kingdom supported by ARIA's funding in the relevant financial year.”

This amendment would require ARIA's annual report to contain details of the geographical distribution of activities funded by ARIA.

The Chair: With this it will be convenient to discuss the following:

Amendment 30, in schedule 1, page 10, line 5, at end insert—

“(3) This report must include statistics regarding the percentage of its funding disbursed in each region of the UK.”
This amendment is intended to provide greater transparency about the destination of ARIA’s funding disbursements within the UK.

Amendment 16, in clause 2, page 2, line 10, leave out “in” and insert “across”.

This amendment would require ARIA to have regard for the benefits of its activities across the nations and regions of the UK in exercising its functions.

Amendment 17, in clause 2, page 2, line 12, leave out “in” and insert “across”.

See the explanatory statement for Amendment 16.

Amendment 18, in clause 2, page 2, line 14, leave out the first “in” and insert “across”.

See the explanatory statement for Amendment 16.

Chi Onwurah: These amendments are all concerned with ensuring that the benefits of ARIA are spread across our country and contribute to a more equal and prosperous country. Amendment 14 would insert a new sub-paragraph requiring ARIA’s annual report, for which there is provision elsewhere, to contain details of the geographical distribution of activities funded by ARIA, while amendments 16, 17 and 18, which relate to clause 2, would require ARIA to have regard for the benefits of its activities across the nations and regions of the UK in exercising its functions.

We tabled these amendments in a constructive spirit, to improve the Bill in line with the Government’s own aims, as we understand them. During and since the general election, there has been significant discussion about the importance of ensuring that our whole country benefits from economic prosperity and from the transformational impact of ARIA.

Stephen Metcalfe (South Basildon and East Thurrock) (Con): I accept what the hon. Lady says about geographical spread and making sure that we are treating the country fairly and levelling up, but we have to accept that while £800 million over a four-year period is a lot, £200 million a year is not a huge amount. We know that we are focusing ARIA on a small number of projects. The danger is that we dilute the impact that ARIA could have using that money by trying to demonstrate that we are spreading it equally across the country. The danger with that is that we do not achieve what we set out to achieve in the first place.

Chi Onwurah: There are two challenges here. ARIA’s funding is between 1% and 2% of the UK’s science spend, depending on whether the aims of the current Government are actually met, so in some respects it is considered too small to be subject to reporting requirements. Yet we also hear of how it is expected—indeed, required—to have a transformational impact on all our lives. If that impact is going to be transformational, surely it is critical that it should be as equitable as possible.

We have tried very hard to reflect those slightly conflicting aims. Amendment 14 is a reporting requirement; amendments 16, 17 and 18 are to “have regard to”. We have not set targets. We have not said that it has to be a certain proportion, but particularly with regard to amendment 14 there can surely be no objection to reporting how the funding has been spent. That is a basic requirement of transparency.

The hon. Member is right to infer that people may draw conclusions from that reporting, but I tend to feel that information is empowering, regardless of what the conclusions are, so the amendment takes a reasonable line between requiring that the spend be in some respects regionally distributed, which it does not do, and ensuring that the information is there to assess the extent to which ARIA is living up to its overriding goal—again, we do not have a mission, so let us say goal—of transforming our society.

The Opposition believe that that goal is possible. We believe that science and research, as I have said, can be the engines of progress for our society, but it needs to be for and by everyone, not simply for the few. It is essential, as I have said, that each region of the UK benefits from the creation of ARIA. The Secretary of State told the Science and Technology Committee that the Government wanted ARIA

“to reflect the wide talent and geographical spread of the United Kingdom”,

but there is nothing in the Bill to measure the extent to which it does that. As we have seen, the Bill fails to mention the devolved nations and does not outline any reflection of the geographical realities of the United Kingdom.

Amendment 14 is simply about requiring reporting so that the Government—whichever Government we have—can measure the impact that ARIA is having on the very important desire to reduce the regional inequalities in our country. It does not tie the hands of ARIA’s leadership; it just imposes reporting requirements. That is really important when we reflect that the Campaign for Science and Engineering found that for every £1 invested by the Government on research and development we receive 20p to 30p back each and every year. Surely we have a right to know where that money is going geographically, as well as which areas it is going to.

As a northern MP, I know that the north receives less than half of the life sciences investment per head that the south of England does, despite having great teaching hospitals and significant health inequalities that truly need to be transformed. We heard an important contribution from Tabitha Goldstaub of CognitionX, who said that

“ARIA has to be independent, but it also needs to ensure that it works really closely with central Government and with regional and local government. Local government spends about £1 billion on procurement, and cities are key investors in infrastructure, so finding a good link with local government, as well as with central Government, is important...Regional strengths deliver benefits to actual localities.”—[*Official Report, Advanced Research and Invention Public Bill Committee*, 14 April 2021; c. 56, Q54.]

We also heard from John Kingman, the chair of UKRI, that its structures involve regular consultation with the devolved Administrations. It is important that we see how well ARIA is able to benefit also from that engagement, whether indirectly through the UKRI or through its competitions and other means of funding.

3.15 pm

I will comment briefly on amendments 16, 17 and 18, which would require ARIA to have regard for the benefits of activities across the nations and regions. ARIA presents an opportunity to drive innovation across the country, and this is about ensuring that it does not deploy a business-as-usual approach, which would risk

undermining the shared benefit that it should provide. Research and development is a vital driver of growth, both nationally and at regional level. In its current form the Bill requires ARIA to promote scientific innovation and invention “in” the United Kingdom. The amendments suggest simply changing that word to “across”, so that the benefits accrue to all constituencies, towns and villages. As I have said previously, the Government have made many promises over the past 18 months to level up all of the UK’s regions. We would like to see those promises translated into institutional reality, and that is what these three amendments seek to achieve.

Daniel Zeichner: I feel passionately about this issue because I represent a part of the country that often comes in for criticism, in the sense that some people, even some of my colleagues, say to me, “You’ve already got everything—you shouldn’t be getting any more.” This is a complex argument. If some areas have a long tradition of doing well and competing internationally, we can hardly deny them the resources to carry on with their work. However, we are painfully aware that there is a danger of overheating in some parts of the country.

I chair the all-party parliamentary group for the UK’s innovation corridor, which is, essentially, London-Stanstead-Cambridge, and there is much discussion at the moment about the Cambridge-Milton Keynes-Oxford arc—the so-called golden triangle. The discussion seems to have been going on for years and years—certainly for as long as I have been in this place, and long before that. There is this hope that through the clustering effects we can do much better than we already do, and we look to examples in other parts of the world to see how it is done.

The reason I support this amendment is that this is not simple or easy. There have been many attempts to spread the Cambridge cluster effect. In fact, ironically, it often seems to cluster more and more in particular bits of Cambridge. It is very hard to get people to go to other places, but that is what we want to try to encourage. One of the ways in which we will do that is by having the data and the information. This is a great opportunity for ARIA to be mindful of that in its report. It is not a difficult thing to do. It should tell people what is going on and where it is putting its resources. If it is not working in the first few years, that would give us the opportunity to intervene and make a change.

Chi Onwurah: Once again, my hon. Friend has reminded me in his excellent contribution of an important point that I should have made, which was that the regional development agencies, abolished by the Conservative coalition in 2010, did report on regional innovation and science spend. Whenever I speak to the North East England chamber of commerce, I am told that one of the difficulties in making the knowledge exchange framework accessible or understandable is the lack of data on regional science spend. Part of the point of this amendment is to help restore some of that data.

Daniel Zeichner: That is absolutely right. One of the many tragedies of the last 10 or 15 years has been the fact that strong attempts by the last Labour Government to have a positive regional policy were swept away. Vince Cable, I think, described the destruction of the regional structures in 2010 as positively Maoist. Astonishingly,

Lord Heseltine later came to Cambridge to bang the drum for regionalism outside the very offices that had been shut by his own Government a few months earlier.

We do not have a good record on regional policy in this country. We need to do better in future, for everybody’s benefit. Frankly, my city can do without the overheated house prices and the problems that come with everything being clustered in one place. It would be good for us, but also for everybody else, to get more balanced economic growth across the country.

We could do one small thing today—and I really do not see how it would be difficult for the Government to concede. I do not know how many Bill Committees I have been on—I have never yet had any success, although I live in hope. I make this plea, however, because I really do not see how the concession could be that painful.

Stephen Flynn (Aberdeen South) (SNP): I rise, obviously, to speak in favour of SNP amendment 30, which almost ties in with what is proposed by the shadow Minister. It is about providing greater transparency on the destination of ARIA’s funding disbursements within the UK.

I just want to pick up on a couple of things that have been said already. The shadow Minister reflected on the fact that the Bill makes no mention of the devolved nations. She almost seemed surprised, but that took me a bit aback because I am not surprised at that in any way, shape or form. I do not think anyone even on the Government Benches is over-surprised that they forgot to mention Scotland, Wales and Northern Ireland.

The hon. Member for South Basildon and East Thurrock mentioned his concerns about drawing conclusions. Yeah, I will be drawing conclusions about where that money goes and I am sure that every single person in Scotland will.

Stephen Metcalfe: If we were discussing how the Government aim to spend our £22 billion a year on science and research, there would be a much better argument for the amendment. But we are talking about high-risk, high-reward science, where a focus on a particular technology has the transformational effect that we are after. That might be the University of Strathclyde and its quantum technology research—I have no objection to that being the area of funding. But if the area happens to be Cornwall, Cambridge, London or somewhere else, I do not think we should hamper ourselves on this particular aspect of a new agency by trying to set targets. We know that if we set a target, someone tries to meet it.

Stephen Flynn: I understand the point that the hon. Gentleman is making, although I would caution that, when speaking to an MP from Aberdeen, people do not tend to mention a Glasgow university—it doesn’t go down too well, that’s for sure.

I understand the purpose of the hon. Gentleman’s point, but he must understand our concerns about making sure that Scotland receives its fair share of funding and investment from the UK Government while we remain a part of the United Kingdom. That ties into the wider narrative from this UK Government since the 2019 election. The views and will of the people of Scotland have been completely disregarded.

What we are seeing from the UK Government are attempts to impose their will on Scotland. We saw that with clause 46 of the Internal Market Bill and with the

[Stephen Flynn]

levelling-up fund that bypasses devolution but does not deliver for the communities in Scotland that it is needed for. This fits into our wider concern about the direction of funding from the UK Government.

As I said earlier, £800 million is involved. While Scotland is still a part of the UK we will take an interest and argue Scotland's case for getting that funding into Scotland. It should, of course, be at the Barnett level. I would welcome assurances from the Minister that we will see investment in Scotland—not necessarily in Glasgow or at the University of Strathclyde, but perhaps in Aberdeen: that would be much more beneficial. I hope that we will see that level of investment in Scotland and I hope that she will provide that commitment, in which case I will be able to withdraw my amendment.

Kirsty Blackman: Does my colleague agree that what we saw happening in relation to Northern Ireland—the money funnelled there and the fact that we did not get our Barnett amount of that cash—increases our worry about the fact that we might not see the Barnett amount for ARIA either?

Stephen Flynn: Absolutely; my colleague is spot on. As I said, this is not new, and the example she has provided is another clear indication of this UK Government's failure to take cognisance of Scotland's needs. If the Minister wishes to stand up and tell me that Scotland will get its fair share and we will get a Barnett sum spent in Scotland, I will be more than happy to withdraw my amendment; otherwise, I will push it to a vote to ensure that Scotland's needs are met.

Amanda Solloway: I shall turn first to amendments 14 and 30. The objective behind them is really important; we have spoken extensively about the need for ARIA's funding to reach beyond the usual suspects. In my view, that applies to where that funding goes as much as to the formality of the research setting. That also reflects the wider Government priority. The R&D places strategy, due to be published this summer, represents a key part of our ambitions for R&D and innovation. It builds on the approach set out in the R&D roadmap.

The purpose of the places strategy is to ensure that R&D benefits the economy and society in the nations, regions and local areas across the United Kingdom, contributing to the Government's wider levelling-up ambitions. I would like to make one key point about ARIA: as discussed previously, many of the details of ARIA's operation will be set out more fully in a future framework document. I suggest that that document is the appropriate place for stipulations on the content of ARIA's annual report.

It is extremely likely that ARIA will be required to provide in that report the type of geographical information sought in the amendments, but it would be beneficial to consider that in the round, alongside the other information that we might require ARIA to include in the report. The most appropriate and helpful information for ARIA, or Government bodies generally, to provide may also change in the future. To include specifics on the face of the Bill is impractical in that respect, as that would be inflexible.

On amendments 16, 17 and 18, ARIA will seek transformative scientific and technological breakthroughs, the outputs of which will have benefits across the United Kingdom. For example, a leap forward to driverless technology could create economic benefit to improve the quality of life across the UK. The attraction of the ARPA model is that its funding is laser-focused on achieving transformative outcomes. While £800 million up to 2024-25 is a meaningful amount of funding, it is a small proportion of the R&D spend. For those reasons, I urge the hon. Member for Newcastle upon Tyne Central to withdraw her amendment.

Chi Onwurah: I thank the Minister for her response. I am pleased to hear that she believes that the information requested in amendment 14 is likely to be included in the reporting requirements of ARIA. On that basis, I am—well, “happy” is not the right word, but I will withdraw amendment 14. I do so also on the basis that she understands its importance.

I feel, however, that in her response to amendments 16, 17 and 18, the Minister has had it both ways: she is saying that the benefits will be felt across the nation but that a requirement to have regard for the benefits across the nations and regions of the UK is too much. Its borders may move, but the geographical reality of our United Kingdom as a country of nations and regions will, I hope, remain, and so a requirement to have regard to the benefit across the nations and regions seems eminently sensible—indeed, it is a minimal requirement. I would like to press amendment 16 to a vote later, but I beg to ask leave to withdraw amendment 14.

Amendment, by leave, withdrawn.

3.30 pm

Kirsty Blackman: I beg to move amendment 29, in schedule 1, page 10, line 5, at end insert—

“(3) The report must include—

- (a) statistics on the gender balance of—
 - (i) executive board members
 - (ii) non-executive board members
 - (iii) senior staff; and
- (b) financial information on the gender pay gap among ARIA employees and appointees.”

This amendment is intended to ensure that this public body may be held accountable for its gender representation.

The Minister just made a helpful comment about the memorandum of understanding that will happen between BEIS and ARIA, but her comment was not quite strong enough for me. She said it was likely to include these things—perhaps very likely. Will the Minister tell us that it will include the geographical disbursement covered in the previous amendment, and the gender balance of the board members and senior staff and the gender pay gap, as covered in amendment 29? If we are asking companies to report on the gender pay gap in their annual reports, as we are and should be doing, it is not out of the question to ask ARIA to do the same.

The measure is particularly important because the Government are absolutely intent on excluding ARIA from freedom of information; if ARIA is excluded from FOI, we are not able to see that information. We will not have the level of scrutiny that we normally have over a public body. We have talked at some length—the shadow Minister spoke at some length—about the

importance of gender balance, diversity and having women in senior roles. It is also important that we do not have a gender pay gap within ARIA. We know that the glass ceiling in areas such as engineering is very significant. We want to ensure that women are promoted to all levels within the organisation, that women are paid fairly within it and that we are able to scrutinise the information.

I would really appreciate it if the Minister stood up and said, “Yes, absolutely—we will be negotiating that as part of the MOU.” That would be massively appreciated because it is incredibly important.

Chi Onwurah: I rise briefly to speak in support of the amendment. As the Bill stands, ARIA will not be subject to freedom of information requests. If there is no requirement to report on gender balance and the gender pay gap, will we have any understanding of the way in which ARIA is reflecting the gender diversity that we hope to see in the organisation?

Amanda Solloway: Again, I draw hon. Members’ attention to the existing obligations under the public sector equality duty and the Equality Act 2010, to which ARIA will be subject. Under the public sector equality duty, ARIA must, in carrying out all its functions, have due regard to the need to eliminate discrimination, harassment, victimisation and any other conduct; advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it; and foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

This is a strong statutory duty that will apply to the recruitment and remuneration of ARIA staff. Should ARIA have 250 employees, there would also be a requirement to publish its gender pay gap information, based on the point at which the data becomes statistically significant and supports a good analysis.

I believe this specific duty is sufficient for ARIA, as indeed it is for all other employers. I do not think that any further provision in the Bill is required and I hope the hon. Member will withdraw the amendment.

Kirsty Blackman: I understand that there are public sector duties in relation to this issue, but ARIA could easily fulfil all those by employing only men—it could just pay them all at whatever level because they would all be men. It would fulfil its duties in that regard because there would be no gender pay gap, but it would be incredibly important for us to know that ARIA had only fulfilled its duties by taking that step, because it is public money that is being spent.

While Scotland is still part of the Union we want to be able to scrutinise how the money is spent. It is important that we have information on whether there is a gender pay gap in ARIA, whether or not it has 250 employees. Again, it is a public sector organisation spending public money but exempt from public procurement regulations and exempt from FOI. That means we are not able to adequately scrutinise the money spent, to ensure that there is diversity and fairness, making sure that women are not only in the lower roles in the organisations, but are starting at or being promoted to higher roles.

What the Minister said was not strong enough for me; I would like for her to have reassured us that the MOU will have that duty written into it. I would like to push the amendment to a vote.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 8.

Division No. 9]

AYES

Blackman, Kirsty
Butler, Dawn
Flynn, Stephen

Furniss, Gill
Onwurah, Chi
Zeichner, Daniel

NOES

Baker, Duncan
Bell, Aaron
Fletcher, Mark
Mayhew, Jerome

Metcalf, Stephen
Richardson, Angela
Solloway, Amanda
Tomlinson, Michael

Question accordingly negated.

Amendment proposed: 30, in schedule 1, page 10, line 5, at end insert—

“(3) This report must include statistics regarding the percentage of its funding disbursed in each region of the UK.”—(Stephen Flynn.)

This amendment is intended to provide greater transparency about the destination of ARIA’s funding disbursements within the UK.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 8.

Division No. 10]

AYES

Blackman, Kirsty
Butler, Dawn
Flynn, Stephen

Furniss, Gill
Onwurah, Chi
Zeichner, Daniel

NOES

Baker, Duncan
Bell, Aaron
Fletcher, Mark
Mayhew, Jerome

Metcalf, Stephen
Richardson, Angela
Solloway, Amanda
Tomlinson, Michael

Question accordingly negated.

Question proposed, That the schedule be the First schedule to the Bill.

Amanda Solloway: I welcome the detailed discussion that schedule 1 has attracted. It is to be expected since the schedule sets out ARIA’s governance arrangements, including the make-up of the board and how members and staff are appointed and removed. There are elements of schedule 1 that are standard to most statutory corporations and that mirror the measures on UKRI in the Higher Education and Research Act 2017. Those include the paragraphs about ARIA determining its own procedures, the delegation of functions by ARIA, and the preparation and laying before Parliament of audited accounts and annual reports.

I reiterate that ARIA will be subject to parliamentary scrutiny in the same way as other statutory corporations, both by Select Committees, including the Science and Technology Committee—I am sure that my hon. Friend the Member for Newcastle-under-Lyme and the hon.

[Amanda Solloway]

Member for Brent Central will contribute to that fully—and by the National Audit Office, which is expected to report in detail on ARIA for discussion at the Public Accounts Committee. With reference to this morning's discussion, it is therefore clearly the case that ARIA will be held to account.

As with the rest of the Bill, in schedule 1 I have been very mindful of the need to strike a balance between providing ARIA with the independence to operate freely and ensuring sufficient Government and parliamentary oversight to protect the use of public funds. I also emphasise that the creation of ARIA has been welcomed by the UK research and innovation community, and I again point to the integrity of that community.

I will explain the rationale behind the key paragraphs that are specific to ARIA and that have not yet been discussed in relation to the amendments proposed to schedule 1, starting with those on membership. Paragraph 2 sets out ARIA's membership. Its executive members must include the chief executive officer and chief financial officer, and between two and five other members. As we heard from Professor Philip Bond last week, that number reflects the need for ARIA to be a nimble agency, with agile decision-making structures.

ARIA's non-executive members must include the chair, the Government chief scientific adviser and other members appointed by the Secretary of State. The Government chief scientific adviser will provide technical expertise and a helpful and effective link between ARIA's activities and those of Government, while limiting any direct interference from Ministers. Non-executive members must comprise the majority of ARIA's board, which is a matter of good governance.

Paragraph 3 sets out that the first chief executive officer will be appointed by the Secretary of State, ensuring that the initial leadership sets the right foundation for ARIA. Thereafter, executive appointments will be made by the chair, such that ARIA can maintain its independence from Government.

Paragraph 4 sets out that the chief executive officer must be appointed for a fixed term for a maximum of five years, and that a person cannot be appointed as CEO more than twice. That approach will ensure strong leadership, energy and renewal at CEO level, and we have seen that successful approach produce results for DARPA.

As is standard for statutory corporations, paragraph 14 states that ARIA must prepare annual accounts that must be sent to the Secretary of State and the Comptroller and Auditor General. The CAG must examine, certify and report on statements of accounts and send a copy of the report and certified statement to the Secretary of State, who in turn must lay copies before Parliament. As the Committee will be aware, the NAO is also able to conduct value-for-money examinations of ARIA, as per the National Audit Act 1983. The laying of annual accounts and reports before Parliament, combined with the NAO examination represent an opportunity to scrutinise ARIA's activity and its use of public funds, as is standard for public bodies.

I would like to take this opportunity to address a point raised by the Secretary of State on Second Reading which left some ambiguity. He said that there was a

commitment in the Bill to audit ARIA's procurement activities. Any procurement spending will of course be included in ARIA's accounts and be subject to audit in the normal way, according to paragraph 14, but we have made a further non-legislative commitment to explore how ARIA's procurement activities specifically might be audited and reported on as a counterbalance to the exemption that the Bill gives ARIA from obligations on a "contracting authority" under the public contracts regulations. That is not within the Bill, as the Secretary of State's comment could be taken to imply, but will none the less be an additional commitment to transparency and good governance for ARIA.

Schedule 1 contains provisions where necessary for ARIA to be able to operate as a statutory corporation and it is therefore essential that it remains part of the Bill.

3.45 pm

Chi Onwurah: I thank the Minister for her comments on schedule 1. While I necessarily disagree with her assessment that the schedule contains all the checks and balances, accountability and oversight that are required, I will not oppose it.

The National Audit Office audit to which the Minister referred is a very limited safeguard against some aspects of conflict of interest and the misuse of public money, and the wider concerns that we have. It is limited to providing a true and fair opinion about whether the public body's financial statement is free from material misstatement, whether caused by fraud or error, and therefore does not address our concerns about accountability. The National Audit Office conducts 400 such audits annually and it would not necessarily prevent the mismanagement of public funds in ARIA or other bodies. I hope that the Minister will reflect on the importance of improving accountability as the Bill proceeds.

Question put and agreed to.

Schedule 1 accordingly agreed to.

Clause 2

ARIA'S FUNCTIONS

Chi Onwurah: I beg to move amendment 15, in clause 2, page 1, line 7, at end insert—

"(1) In exercising its functions, ARIA must have regard to its core mission.

(2) In this section, 'core mission' means—

- (a) for the period of ten years after the date on which this Act is passed, undertaking activities which support the achievement of the target established in section 1 of the Climate Change Act 2008;
- (b) thereafter, that mission or missions which the Secretary of State establishes by regulations every five years.
- (c) regulations under this section—
 - (i) shall be made by statutory instrument, and
 - (ii) may not be made unless a draft has been laid before and approved by resolution of each House of Parliament."

This amendment would require ARIA to consider its core mission in exercising its functions. For the ten years following the Act passing, that core mission would be undertaking activities to support the achievement of net zero. Thereafter, its mission will be established by statutory instrument subject to the draft affirmative procedure.

The Chair: With this it will be convenient to discuss amendment 35, in clause 2, page 1, line 8, at end insert—

“(A1) ARIA’s primary mission will be to support the development of technologies and research that support the UK’s transition to net zero carbon emissions or reduce the harmful effects of climate change.”

This amendment sets the primary mission for ARIA to support the development of technologies and research that support the UK’s transition to net zero carbon emissions or reduce the harmful effects of climate change.

Chi Onwurah: It has been a long day and we have had lively debates covering many important themes set out in this admittedly short Bill. We now come to one of the critical themes: the mission of ARIA. What is ARIA for?

Amendment 15 would require ARIA to consider its core mission in exercising its functions. Under the amendment, for the 10 years following the passing of the Act, that core mission would be to undertake activities to support the achievement of net zero. Thereafter, its mission would be established by statutory instrument, subject to the draft affirmative procedure.

I am surprised that I find myself in the position of needing to argue that ARIA—the Advanced Research and Invention Agency—requires a mission and that that mission should be net zero, which is the greatest existential challenge facing our country and the world right now.

We welcome ARIA, as we have said. We recognise that there is a gap in the UK’s research capability, which ARIA can and should fill, but we believe strongly that ARIA will succeed only if it is given a well-defined mission, which the Government must play a significant role in setting. As we heard in the evidence sessions—and as is, I believe, the opinion of the Minister—ARIA should not try to replace either blue skies research institutions or translational institutions, but should bring the two together to focus on the transformative effects that science and technology can have on society. I am sure that we are all united in the view that ARIA can have a transformative impact.

This is an opportunity for the Government to establish a mission-led funding agency that can benefit us all. With no mission and the whole of the realm of science—the whole of the unknown and the less understood—to choose from, the risk is that ARIA will be directionless, providing no societal return for taxpayer investment, or that it will be prey to vanity projects, providing return only for a few.

In evidence to the Science and Technology Committee, Dominic Cummings—I am mentioning him once again as the original inspiration and architect of ARIA—held up some sort of a diagram and said that general UK research was one bit and that ARIA should look at all the rest. That gave the impression that it would be like the SS Enterprise going off in search of new areas, but even the SS Enterprise—I know that “Star Trek” fans are present—had a mission, which was to seek out new civilisations. It was not a mission to—

Stephen Metcalfe: Will the hon. Lady give way?

Chi Onwurah: I am speaking about “Star Trek”, so let me finish my point and then I will give way. It was not a general mission to go around the universe and galaxies.

It was not a mission to look at mining new minerals or whatever. It was a mission to seek out new civilisations, yet here we have ARIA being proposed as an agency without any mission whatever.

Stephen Metcalfe: Just to clarify, I think it was the USS Enterprise. I believe that ARIA has a mission, which is to boldly go to areas of science that we have not gone into before. A focus on impact, high risk and high reward is not what we currently have, and we should not hamper it at this early stage. I would not for one moment deny that climate change is a huge threat that needs to be addressed, but that is not necessarily where the agency should focus. Why would we want to tie its hands before it has even started to look at the transformational science out there?

I also have great concerns, because the hon. Lady said she felt that the Government should have huge input into the mission of ARIA. That would potentially breach the Haldane principle, which Government after Government have applied and stuck to in order to make sure that politicians are not influencing scientists in what areas that they research.

Chi Onwurah: I accept that it is indeed the USS Enterprise, and I thank the hon. Member for that correction. On the rest of his contribution, I will say once again that I have a great deal of respect for the hon. Member, but to boldly go where no one has gone before is not a mission. It is not even a direction—it is explicitly not a direction. As I said, the USS Enterprise’s mission was to seek out new civilisations, so it was anthropological rather than another domain of science. ARIA has no mission.

We do think we have to talk about the Haldane principle, given that we have seen the acceptance of mission-oriented research, including the grand challenges that were discussed during the evidence sessions. That makes it clear that we can ascribe a mission to ARIA without breaching the Haldane principle. The Government should not outsource their responsibility to direct the transformative change that ARIA can bring to our greatest challenge, which is one that—the hon. Member is familiar with this—inspires so many young people and that can get public buy-in: climate change and the need to address the impact it will have on our planet.

Dawn Butler: Should we not be proud as a Committee to say that ARIA will achieve net zero in whatever project it pursues? That is essentially working on the edge of the edge—looking at forward technology, ensuring that we save the planet and ensuring that we do not add to the erosion of the ozone layer—so is it not progressive and transformative to set a parameter around net zero?

Chi Onwurah: I absolutely agree with my hon. Friend; I think that it is progressive, transformative and very necessary. We heard today that the Prime Minister has decided to set another target for our emissions—I think that it is to slash UK emissions by 78% by 2035—undaunted by the fact that he has not met any of the targets that he has set previously.

This issue is not about setting targets; it is about changing the way in which our economy and our society work, to reduce our emissions. Just think of the role

[Chi Onwurah]

that ARIA could play in that process. My hon. Friend suggested that achieving net zero is not a narrow mission; it is a broad mission, because net zero impacts every aspect of our life. An ARIA CEO would have plenty of discretion in choosing which aspects of the climate and environmental emergency to address.

Aaron Bell: That is potentially a worthy mission, but the point is that the hon. Lady said there is no direction. Well, going boldly is going to the frontier—even “The Final Frontier”, if we go to “Star Trek V”. [Laughter.] The edge of the edge is not in one direction. The edge is a circle, or even a sphere—all the areas that we do not know about. Trying to focus on one narrow point, as she is doing with the amendment, misses the point of ARIA and the potential for its transformative effect across a wide range of disciplines and lots of areas of science, technology, engineering and, indeed, perhaps even mathematics.

Chi Onwurah: I thank the hon. Gentleman for that contribution. Envisaging the edge of the edge, whether it is a circle or an ellipse—whatever it is, it is obviously broad. It is too broad. I think it could be anything. I think this Committee believes that ARIA must have a transformative impact on society, otherwise why are we here? The area where we need a transformative change is in climate change, which is a hugely broad area.

The UK, under this Government, is off track to meet current targets. The Government have no ambitious green recovery plan, they have axed the vital housing retrofit scheme and they have cut subsidies for electric vehicles. They are desperately in need of focusing our activities on the impact of climate change.

We know that two of the great challenges in reducing our emissions are transport and the existing housing stock. Think what impact an inspired programme director in ARIA could have on that great challenge of effectively insulating and reducing the emissions from our 20 million or so homes, or ensuring that transport, which the Government have said will be included in their emissions targets, is green. That is not a narrow mission. Net zero is not a narrow mission; it is as broad and as big as our planet, and it is certainly where we desperately need to focus our attention.

In response to the point about the Government choosing the mission, I would say that only the Government have the democratic mandate—they won the election—to choose the mission, while allowing ARIA’s leadership the operational independence to implement that mission. It is critical that the mission reflects public concerns, to establish buy-in as well as the tolerance for failure. Without a clear mandate from the Secretary of State, ARIA’s leadership will be put in the unenviable position of having to decide which Government Departments and policies to prioritise, and who will have the ear of the ARIA CEO. I say again that the Government cannot outsource this responsibility as they have chosen to outsource so many other responsibilities.

We are at the beginning of the decisive decade, in which the world must avert the worst impacts of climate change, and ARIA could provide much-needed research to help advance the solutions that are necessary to decarbonise our economy rapidly and fairly. In addition, this year the UK will host the critical COP26 UN

climate summit. Would it not be a fantastic message to say that our leading high-risk, high-reward agency is focused on climate change? Would it not provide a model for other countries to follow?

4 pm

On the clearly defined mission, I ask the Minister to consider the specific risk that ARIA could finance research into new oil exploration, for example, or new methods of extraction. The Government must ensure that ARIA’s funding is not directed towards activities that are incompatible with or contradictory to the wider public objectives.

Many of the witnesses in our evidence sessions stressed the importance of a customer for ARIA’s work, but without a mission set by Government there is a risk that the private and public sectors will lack the confidence in ARIA’s credibility to become customers; a customer needs to know what they are buying. In addition, ARIA needs to have a direction, and only the Government can really set that, as many witnesses said. Professor James Wilsdon, the digital science professor of research policy at the University of Sheffield said:

“The one thing that many of us have been calling for since this idea was floated as an option for the UK system is more clarity on its purpose—its mission...It is regrettable, in a way, that it has reached the stage of a Bill without that question having yet been properly answered.”—[Official Report, *Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 18, Q16.]

Philip Bond, addressing the point made by the hon. Member for Newcastle-under-Lyme, said:

“It is rather obvious that there are many interesting and important problems societally. It is obvious that there are many, many ways in which somebody could look to do things, whether with education and helping kids to learn better, or with the NHS or anything else.”—[Official Report, *Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 24, Q5.]

He was making the point that it should be left to the director of ARIA. In return, I would make the point that, given there are so many things to be done and so many ways in which this money could be spent, should not the Government have some input into the direction?

Tris Dyson, managing director of Nesta Challenges, underlined that the mission was important for the culture, saying:

“The ARIA team will have to establish a culture where they trial things out, set targets and objectives and have constant reviews where they get together and decide whether to kill things off. That is clearer when you have defined missions or objectives that you are working towards. It is much harder when you are fostering lots and lots of different things.”—[Official Report, *Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 12, Q7.]

Mariana Mazzucato, a professor in the economics of innovation and public value who has worked with Government, particularly in setting the grand challenges, pointed out that

“it has always been linked with a vision or mission of what is to be done. Again, in the wartime scenario, it is clear that the DARPA model was mainly about military goals, but the Advanced Research Projects Agency – Energy, or ARPA-E, is about renewable energy and a green transition.”—[Official Report, *Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 18, Q16.]

Adrian Smith, the president of the Royal Society, said:

“If we are aiming for £22 billion by 2024-25, £800 million is not a large sum of money, so if we have a plethora of missions, then I think we will go wrong. ARIA has to have focus of mission

and a commitment to the model over the long-term.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 63, Q62.]

Again, only the Government can provide that. David Cleevely agreed. He said:

“I think it is for the Government to set the priorities where they feel that there are specific challenges. We have talked about climate change, for example. That is one, and there may be others that one would want to address, either in health or in other topics.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 75, Q78.]

The hon. Member for Newcastle-under-Lyme raised the example of the vaccine taskforce—an example that has been raised a number of times. The statement of policy intent says that

“our Vaccines Taskforce and Rapid Response Funds, have illustrated the importance of agility in funding and decision-making. This policy is one of many across the landscape of public science funding which will learn lessons from those successes.”

The vaccines taskforce had a mission—a very clear mission. If that is something we have to learn from, surely one of the learnings is that the new agency must also have a mission. The statement of policy intent talks about the new research funding body being based on the principles of DARPA, and we heard repeatedly in the evidence sessions that one of the key, critical principles of DARPA was to have a mission.

We agree that ARIA can play a significant and transformative role in our future scientific and research landscape. We agree also that ARIA must focus on a small number of specific missions or challenges if it is to make an impact. We heard so much confusion about what ARIA was for during the evidence sessions, because of a lack of clarity from the Government. If the Government do not set the mission so that the £800 million is spent in a focused way that makes a significant impact, and so that the Government are accountable and take responsibility for the success of the agency and can command the buy-in of all Departments across Government, as well as of the public more generally, ARIA will be subject to the whim or influence of an individual chief executive or chair or those who have their ear, and the agency will not be set for success, which is what we want to see.

Daniel Zeichner: It is a pleasure to follow my hon. Friend, who has made a strong case. This issue goes to the heart of the discussion we have been having all day and goes back to some of the comments I made in my opening remarks.

We were castigated earlier for talking too much about Mr Cummings. I say that we must cast off the curse of Cummings. I thought the Government had moved on—they got rid of him—but the Bill still has all his hallmarks. The chaos and confusion that he espouses—his *raison d’être*—will make this agency fail. That is the problem. I encourage the Government to move past it. The evidence from the witnesses all the way through was about the confusion. I understand Marina Mazzucato is advising the Government. She made it ever so clear that ARIA will only work if there is a clear mission. The Americans made it absolutely clear that if we want to do something like they have, that is the way to do it.

The Government seem to be completely confused about whether they want to learn from examples elsewhere, or do something very different—although they are offering

no evidence as to why that should work; sadly, we have seen examples in the past of attempts to do this kind of thing that have not worked. If we are going to learn from the examples elsewhere, surely we have to listen to the people who know how they work. I am at a loss to understand why the Government are not listening to the advice.

The first point to make about the amendment is whether to have a mission or not. Do we do it in the way that might work? It is clear that we have to. The second point, which follows, is that if we are to choose something, what should we choose? Witnesses pointed out that there a number of choices. Unsurprisingly, climate change came up on a number of occasions, as it is obvious we should seek to address it. My hon. Friend the Member for Newcastle upon Tyne Central has made all the points on that.

We have an extraordinary situation in that we have COP26 coming up in a few months. Would it not be wonderful if we had this new agency established to address those huge challenges? I fear we are not going to have it, though. We might have the agency and someone sitting around scratching their head saying, “What shall we do today?” when it is entirely obvious what they should be doing.

As I said earlier, we could have some social science challenges. A big one is: how is an advanced country like ours not able to lag a few lofts? We have had 10 years of failure in these schemes, with one scheme under the coalition, and the latest scheme from the Government collapsing a few months ago. It is extraordinary when we know that one of the biggest problems is the state of our housing stock, yet we cannot seem to find a way to run a scheme to improve it. That challenge would fall very much within the scope of our amendment. We want this to succeed.

Finally, I cannot help but refer to the extraordinary document that Dominic Cummings waved at the Committee. I could not see it on the TV screens, so I went and printed it off. I will hold it up. I do not know if anyone has seen it, but this is primary school standard. I want to put in a word for taxi drivers, actually, because what was said earlier was slightly unfair. I am quite happy that taxi drivers are scrutinised—and members of the ARIA board. I also do not want to be in any way disrespectful to primary schools, but really? Do not place the future of the agency in the hands of the legacy of Dominic Cummings.

Aaron Bell: I just wanted to say that that document has been entered into evidence and is available on the Science and Technology Committee website.

Daniel Zeichner: And I am eternally grateful, because that is where I found it. I must say that I was still surprised, because it looks to me more like something that came out of “Star Trek” many years ago.

Stephen Flynn: It is a pleasure to follow the hon. Member for Cambridge. I am not quite sure whether lagging roofs is necessarily within the remit of what I would expect ARIA to be doing. I like to think that the Government could do that notwithstanding any new technologies, but I appreciate the point he was making. I assure members of the Committee that there will be

[Stephen Flynn]

no “Star Trek” references coming from my mouth whatsoever—[*Interruption.*] Or “Star Wars”. We have had quite enough of that. I rise to speak in support of amendment 35, tabled by the SNP, which again is directly related to climate change and the drive towards net zero.

If ARIA is to have a mission—I think it should, and the majority of witnesses last week seemed to be in favour of that—there can be only one focus. I understand the premise of the Government’s not wanting ARIA to be constrained. I think the hon. Member for South Basildon and East Thurrock said that he did not want to hamper ARIA, but I disagree, and I think it is an honest disagreement to have. I do not see how instructing an agency to try to combat climate change and allow us to meet our net zero aims is hampering it. I think that provides not only the focus that the agency needs but the focus that we should all want it to have, because it is the biggest existential crisis facing us.

Stephen Metcalfe: I do not deny that climate change is the biggest issue that we need to address, but a huge amount of research is already going on in that area across UKRI and its £8.8 billion-plus budget. To focus all £200 million a year for ARIA on climate change could miss the point of what we are trying to set up. To me—it may just be me—it is blindingly clear what the mission is: to find areas of research for which funding currently cannot be accessed because it is too risky, and fund that. We talk about high risk, high reward, and that is the mission: to find science that is worthy of research but cannot get funding or support now. If we do that, we might find the next global positioning system, the next computed axial tomography scanner or the next hadron collider—something really inspirational and transformational.

Stephen Flynn: I certainly understand the hon. Member’s point, and, to his credit, he is persuasive in his arguments. None the less, hon. Members will be unsurprised to hear that he has not quite persuaded me, and I do not think his argument would necessarily persuade the witnesses—the likes of Professor Mazzucato and Professor Wilsdon—from whom we heard last week. It is right that we have this discussion, and it is good that we are having it in a positive and constructive fashion, but ultimately I believe there still should be a mission for ARIA. Without it, we are not doing all that we possibly can. DARPA is the clearest example of why a mission is important in this regard. We spoke about it on Second Reading, and we heard from the horse’s mouth just last week about the importance of the mission to DARPA.

4.15 pm

If we are not willing to learn the lessons of something that has been so unbelievably successful—not just for the United States, but for the entire planet—what are we doing? What is the purpose? I would like to hear from the Minister that there will be a change afoot in this regard. I suspect that there will not be one, despite the fact that the Prime Minister has changed his climate change commitments to 2035, as has been mentioned. It is a very noble aim, but we do not just need words. We need action, and the Minister could take the lead on that today.

Kirsty Blackman: I just want to add a couple of things. The hon. Member for South Basildon and East Thurrock gave us what he thinks the mission for ARIA is. Unfortunately, everybody I have heard speak has a different idea of what the mission for ARIA is.

I thought the statement of policy intent was really useful in telling us the mechanics of how ARIA will work. It is really useful in saying why it is set up in a particular way, but it does not actually tell us what the point of it is. Reading through the Bill, I realised not just that ARIA does not have a mission, but that it does not have a direction. Is ARIA about funding scientific things that are not otherwise funded? Is it about increasing productivity, which is mentioned too? Is it about economic growth? Is it about improving the lives of people who live in the UK or elsewhere? Is it about solving scientific problems? I do not know which of those things it is about.

Even if the Government are unwilling to accept the amendments that we have tabled—they should accept them, because, as I have explained, £200 million a year on solving climate change is not a bad thing, even though I think we should be spending significantly more than that—they should be clear about the point of ARIA. How are we measuring performance? How do we know whether it has succeeded? Do we know that it has succeeded if it has spent lots of money? Do we know that it has succeeded if it has funded lots of projects? Do we know that it has succeeded if it has made a difference to the level of productivity within science, research and development in the UK, or to productivity in the UK in general? Is it succeeding if it is coming up with technologies that will improve lives?

We do not know what we are measuring ARIA against, so the Government will presumably—as they do with most things, and as most Governments do—say that ARIA is a success, whatever happens. However, I want to know what criteria it is being measured against, so that we can actually judge it. If it is what the hon. Member for South Basildon and East Thurrock suggested—if ARIA is to fund scientific projects on the edge, regardless of whether that is of an ellipse or a circle—that is fine, because then we can judge it against that. However, I am not clear that that is the Government’s intention.

Amanda Solloway: We heard from some incredibly experienced witnesses last week, with much discussion focused on the question of prescribing ARIA a research focus. Inevitably, cases were made both for and against such an approach. The case made for the approach often referred to DARPA and DARPA-like agencies, but I remind the Committee that ARIA is not DARPA, ARPA-E or ARPA-H. Although we have learned some incredibly valuable things from those agencies, my primary consideration as we develop ARIA has been that it is the right approach for the UK’s R&D system.

Professor Dame Ottoline Leyser said to us last week—
[*Interruption.*]

4.19 pm

Sitting suspended for a Division in the House.

4.35 pm

On resuming—

Amanda Solloway: Professor Dame Ottoline Leyser said to us last week:

“The needs of the country—the priorities that the Government and Ministers set to solve particular challenges for the nation—fall very much within the UKRI remit”.—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 8, Q4.]

Achieving net zero remains one of this Government’s top priorities—demonstrated by the Prime Minister’s 10-point plan—as it is for parties across the House. However, we should continue to successfully mobilise the structures we have in place to respond to the Government’s priorities, including through the industrial strategy challenge fund’s eight clean growth challenges.

We should use ARIA to do something different. Otherwise, I believe we are at risk of causing confusion and duplication of responsibilities. A key difference will be creating a space in the R&D funding system to give autonomy to visionary people. ARIA’s leaders will invite and scrutinise a range of proposals, each of which is defined by a single cohesive and coherent programme objective. That could be a measure towards achieving net zero, or it could be in any other field. ARIA will select the most talented programme managers with the most exceptional idea, and give them the opportunity to discover the next transformational breakthrough.

As we heard in evidence from Nesta and UKRI last week, ARIA is about conducting research in a different way, through new funding mechanisms and giving autonomy to experts. It is not about research in any one field. I agree that is the right approach. It is for that reason that I cannot accept the amendments. I hope the hon. Members will withdraw their amendments. Finally, if ARIA is successful, who knows: we could be saying, “Beam me up, Scotty!”

Chi Onwurah: I thank the Minister for her comments, particularly for that final reference, the spirit of which I wholeheartedly agree with. However, I do not find her arguments against the amendment compelling, and I would like to push it to a vote.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 8.

Division No. 11]

AYES

Blackman, Kirsty	Furniss, Gill
Butler, Dawn	Onwurah, Chi
Flynn, Stephen	Zeichner, Daniel

NOES

Bell, Aaron	Metcalf, Stephen
Fletcher, Mark	Richardson, Angela
Hunt, Jane	Solloway, Amanda
Mayhew, Jerome	Tomlinson, Michael

Question accordingly negated.

Amendment proposed: 35, in clause 2, page 1, line 8, at end insert—

“(A1) ARIA’s primary mission will be to support the development of technologies and research that support the UK’s transition to net zero carbon emissions or reduce the harmful effects of climate change.”—(*Stephen Flynn.*)

This amendment sets the primary mission for ARIA to support the development of technologies and research that support the UK’s transition to net zero carbon emissions or reduce the harmful effects of climate change.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 8.

Division No. 12]

AYES

Blackman, Kirsty	Furniss, Gill
Butler, Dawn	Onwurah, Chi
Flynn, Stephen	Zeichner, Daniel

NOES

Bell, Aaron	Metcalf, Stephen
Fletcher, Mark	Richardson, Angela
Hunt, Jane	Solloway, Amanda
Mayhew, Jerome	Tomlinson, Michael

Question accordingly negated.

Amendment proposed: 16, in clause 2, page 2, line 10, leave out “in” and insert “across”.—(*Chi Onwurah.*)

This amendment would require ARIA to have regard for the benefits of its activities across the nations and regions of the UK in exercising its functions.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 8.

Division No. 13]

AYES

Blackman, Kirsty	Furniss, Gill
Butler, Dawn	Onwurah, Chi
Flynn, Stephen	Zeichner, Daniel

NOES

Bell, Aaron	Metcalf, Stephen
Fletcher, Mark	Richardson, Angela
Hunt, Jane	Solloway, Amanda
Mayhew, Jerome	Tomlinson, Michael

Question accordingly negated.

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 2 sets out ARIA’s functions. As described in the policy statement published on 19 March, ARIA is expected to facilitate a programme manager model. Programme managers lead research programmes designed around highly ambitious scientific or technological visions. Within their overarching programme, programme managers will distribute funding across a range of projects. Individual projects might vary in size, length and scientific discipline, and may be conducted by different institutions or collaborative groups. The projects are not stand-alone, but rather contribute to the overall aims of the programme.

An important feature of clause 2 is ARIA’s power to commission or support others to conduct research, to develop and exploit scientific knowledge, or to collect, share, publish and advance scientific knowledge. While ARIA is expected to perform some research in-house, a significant proportion of its activities are likely to take place externally. For example, programme managers are expected to commission individual research projects from experts across the public and private sectors.

It is vital that ARIA is able to support others contributing to its ambitious programme goals in a flexible way. Subsections (2) and (4) set out the ways in which in exercising its functions ARIA may support others. They should be read in conjunction with supplementary powers, which are set out in paragraph 17 of schedule 1. For

[Amanda Solloway]

example, ARIA may provide financial support through a range of innovative funding mechanisms. That may include making grants, loans and investments in companies or other entities, or any other payment, such as prizes.

A diversity of funding approaches has been integral to the ARPA model's success in the US—we heard from Dr Peter Highnam—and it will encourage ARIA to experiment even more. However, we will balance experimentation with the need to safeguard public funding. The provision of financial support by ARIA is subject to any conditions that are attached to grant funding given by the Secretary of State to ARIA in clause 4, to which I am sure we will return shortly.

Finally, science is an international endeavour. Accordingly, ARIA will be able to fund, conduct, commission and support research internationally. Sir Adrian Smith and Sir Jim McDonald were clear about the importance of ARIA participating in international research in last week's evidence session. Clause 2(5) and (6) state that ARIA's activities are not restricted to the United Kingdom, but in exercising its functions ARIA must have regard to the desirability of doing so for the

benefit of the United Kingdom, through economic growth or a benefit promoting scientific innovation and invention, or improving quality of life.

Clause 2 and the functions really get to the heart of the value that ARIA will add to our UK research and development system, and equip it for the exciting role that it will play. I recommend that it stand part of the Bill.

Chi Onwurah: I thank the Minister for her comments. It is clear from this afternoon's debate that clause 2 does not set out what ARIA will do or achieve, or what its real function will be, but we will not oppose it standing part.

Question put and agreed to.

Clause 2 accordingly ordered to stand part of the Bill.

Ordered, That further consideration be now adjourned.
—(Michael Tomlinson.)

4.46 pm

Adjourned till Thursday 22 April at half-past Eleven o'clock.

Written evidence reported to the House

ARIAB01 Professor Mariana Mazzucato, Founding Director, UCL Institute for Innovation and Public Purpose

ARIAB02 Don Braben, Honorary Professor, Office of the Vice-Provost (Research), UCL

ARIAB03 BioIndustry Association

PARLIAMENTARY DEBATES

HOUSE OF COMMONS
OFFICIAL REPORT
GENERAL COMMITTEES

Public Bill Committee

ADVANCED RESEARCH AND INVENTION AGENCY BILL

Fifth Sitting

Thursday 22 April 2021

(Morning)

CONTENTS

CLAUSES 3 TO 7 agreed to.

SCHEDULE 2 agreed to.

CLAUSES 8 AND 9 agreed to.

SCHEDULE 3 under consideration when the Committee adjourned till this day at Two o'clock.

No proofs can be supplied. Corrections that Members suggest for the final version of the report should be clearly marked in a copy of the report—not telephoned—and must be received in the Editor’s Room, House of Commons,

not later than

Monday 26 April 2021

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The Committee consisted of the following Members:

Chairs: JUDITH CUMMINS, MR PHILIP HOLLOBONE, ESTHER McVEY, † DEREK TWIGG

† Baker, Duncan (*North Norfolk*) (Con)
 Bell, Aaron (*Newcastle-under-Lyme*) (Con)
 † Blackman, Kirsty (*Aberdeen North*) (SNP)
 † Butler, Dawn (*Brent Central*) (Lab)
 † Crosbie, Virginia (*Ynys Môn*) (Con)
 † Fletcher, Mark (*Bolsover*) (Con)
 † Flynn, Stephen (*Aberdeen South*) (SNP)
 † Furniss, Gill (*Sheffield, Brightside and Hillsborough*) (Lab)
 † Hunt, Jane (*Loughborough*) (Con)
 † Mayhew, Jerome (*Broadland*) (Con)
 † Metcalfe, Stephen (*South Basildon and East Thurrock*) (Con)

† Onwurah, Chi (*Newcastle upon Tyne Central*) (Lab)
 Owen, Sarah (*Luton North*) (Lab)
 † Richardson, Angela (*Guildford*) (Con)
 † Solloway, Amanda (*Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy*)
 † Tomlinson, Michael (*Lord Commissioner of Her Majesty's Treasury*)
 † Zeichner, Daniel (*Cambridge*) (Lab)

Sarah Ioannou, Seb Newman, *Committee Clerks*

† **attended the Committee**

Public Bill Committee

Thursday 22 April 2021

(Morning)

[DEREK TWIGG *in the Chair*]

Advanced Research and Invention Agency Bill

11.30 am

The Chair: Order. We are now sitting in public and the proceedings are being broadcast. We now continue our line-by-line consideration of the Bill. The selection and grouping list for today's sitting is available in the room. As Members are aware, the selection and grouping list shows the order of debate on amendments, clauses, schedules and new clauses. The decisions on each follow the order of consideration, which is reflected in the way in which the amendments are marshalled on the amendment paper. A Member who has put their name to the leading amendment in the group is called first. Other Members are then free to catch my eye to speak on all or any of the amendments within the group. A Member may speak more than once in a single debate.

At the end of the debate on a group of amendments, new clauses and schedules, I shall call the Member who moved the leading amendment or new clause again. Before they sit down, they will need to indicate if they wish to withdraw the amendment or seek a decision. If any Member wishes to press any other amendments, including grouped new clauses and schedules, they need to let me know.

Clause 3

AMBITIOUS RESEARCH, DEVELOPMENT AND
EXPLOITATION: TOLERANCE TO FAILURE

11.31 am

Chi Onwurah (Newcastle upon Tyne Central) (Lab): I beg to move amendment 19, in clause 3, page 2, line 20, at end insert—

“(2) On or before the date that an annual report is laid before Parliament in accordance with paragraph 15(4) of Schedule 1, the Secretary of State must lay before Parliament, and publish, a statement containing the required information about details of funding and ARIA's tolerance to failure.

(3) In this section, the required information about ARIA's tolerance to failure is—

- (a) how this section has been interpreted by ARIA during the relevant financial year,
- (b) the number and value of projects funded by ARIA which have been terminated or disbanded on the grounds of failure during the relevant financial year, and
- (c) details of ARIA's funding in the relevant financial year and its proportion of Government research and development expenditure.”

This amendment would require the Secretary of State to make an annual statement regarding ARIA's tolerance to failure.

It is a great pleasure to serve under your chairship, Mr Twigg. Before I speak to amendment 19, I want to say that that in the intervening time between the previous sitting and today, I have managed to break my foot, which was truly an achievement, given that all I was doing was running. If I am not as quick to rise as I would otherwise

be, I hope you will be forgiving, Mr Twigg. The Minister said on Tuesday that the Advanced Research and Invention Agency might contribute to being able to “Beam me up, Scotty!” That would have been highly desirable as I tried to make my way into this place this morning. I am sure we wish ARIA luck in that. I am grateful to everyone for their indulgence as I deal with my new-found injury.

Amendment 19 would require that the Secretary of State makes an annual statement about ARIA's tolerance to failure, in order to provide greater oversight and responsibility. It is very much in keeping with all the amendments that the Opposition have tabled. It is a constructive amendment that seeks to ensure that ARIA's mission, when it has one, and its workings are understood by the public in general and that we have the right oversight to ensure that ARIA is not in any way subject to or tainted by the sleaze that is all too common and evident in the current Government's procurement dealings with their mates. We believe that it is right that ARIA should be given operational independence from Government. We support the idea of specifying that it has a high tolerance to risk and failure, but the challenge is to establish what that tolerance is and to ensure that it is scrutinised properly and that there is public understanding of it.

We believe that ARIA should have a high-risk appetite, but we need greater clarity in order to understand how that appetite will be determined, calibrated and explained, and how Ministers will be accountable for ARIA's failure and success with public money. That is critical and it was a theme of the evidence sessions that, if we are to maintain public support, we must be open and honest about ARIA's tolerance to failure.

Daniel Zeichner (Cambridge) (Lab): My hon. Friend is making a very good introduction to today's proceedings. I express my sympathy to her for having to stand up and sit down; I will not make her do it too often.

The evidence sessions brought some of this out, but does she agree that attitudes to failure in our country are very different from those in America in particular, which is where we are learning lessons from in establishing the agency? Given that, does she also agree that this is a particularly important amendment? The British attitude towards failures is not very tolerant; we do not necessarily view them as being positive. There is a risk here because unless we get this right, it will be difficult for those establishing the agency to be able to explain what they are doing to a wider audience.

The Chair: Ms Onwurah, if it becomes uncomfortable standing, please remain seated.

Chi Onwurah: Thank you, Mr Twigg. I will do that. I thank my hon. Friend the Member for Cambridge for expressing his sympathy. It is always a pleasure to give way to his interventions because he makes such excellent points. Indeed, his point about the differences in culture was brought out in the evidence session, particularly by Professor Glover from the Royal Society of Edinburgh, who said that

“the biggest challenge might be—this will help in engaging with citizens—being up front right at the very beginning that we expect failure, and that failure is part of the measure of success for an agency like ARIA, because if you were not taking any risks, you would not get any failure. The challenge is that, culturally in the

UK, and quite differently, I think, from North America, we see failure through an emotional lens, not a scientific lens, whereas I think the opposite is the case in North America. We need to think about that. In a way, just talking about it and saying that that is the case makes it easier for people to understand that we need to fail in order to get the big rewards.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 61, Q58.]

That goes to my hon. Friend’s point and to the heart of this amendment. We have a cultural difference here in the UK. As someone who has worked in technology in the UK, France and the US, it is very noticeable to me that in the US, for example, a failure is a mark of experience from which one will go on to succeed better, whereas here a failure is intoned in negative headlines and comments.

I am sure the Minister will agree that in order for ARIA to have public support we need to change that culture. By seeking an annual statement on ARIA’s tolerance of failure, our amendment would make a significant contribution and help the public understand the importance of failure. When ARIA fails, there will be headlines saying that public money has been wasted. Certain newspapers, and perhaps even certain politicians, may say that. Would there not be support for both ARIA and the Secretary of State, whoever that may be, if the successes of this high-risk agency were mapped and placed in the context of the failures from which they directly stem?

Our amendment will provide details of the funding provided to high-risk research compared with public investment in wider science and research, so that the public can better understand the proportion of research funding going to this high-risk, high-reward investment. Without public buy-in, it will be very difficult to ensure long-term support for ARIA. Indeed, a consistent theme of the science community’s response to public funding is that it needs to be long term. The amendment would help to ensure that ARIA is not disabled, as it were, at the first failure. We recognise, and this was said in the evidence sessions, that there is a very high probability that ARIA will have a high number of failures, even if the level of failure is difficult to predict.

We want the Minister to be responsible for ARIA’s failures. Although the agency must act independently, this is public money, so there needs to be parliamentary and ministerial accountability for it. In particular, we do not want to see ARIA’s chief executive, whoever that may be, politically abandoned at the first failure. The amendment would help to ensure that accountability and wider understanding are there from the very beginning.

Dame Ottoline Leyser of UK Research and Innovation said:

“In that domain, where you have a very high probability of failure—that is what high risk means—but also an extraordinary probability of amazing levels of transformative success, it is a dice roll. The total number of projects will be relatively small, so it is very hard to predict an absolute number or proportion that one would expect, and one should not need to—that is what high risk, high reward means.—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 12, Q7.]

We understand that we cannot predict the levels of failure, but by measuring and reporting on them, and by ensuring that there is a wider public understanding of them, we can help to begin cultural change, as well as ensure the long-term support for high-risk, high-reward research, which ARIA so fundamentally needs.

The Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy (Amanda Solloway): May I start by saying what a pleasure it is to serve under your chairmanship, Mr Twigg? I wish my colleague the hon. Member for Newcastle upon Tyne Central well. In fact, I was just reflecting that if we were on the *Star Trek Enterprise*, we could have beamed her up and Dr McCoy could have sorted her out.

Chi Onwurah: I thank the Minister for her very kind remarks. I probably should have said earlier that the NHS, and the Royal Free Hospital, which treated me, showed all the support, kindness and innovation that *Bones* in “*Star Trek*” would have done.

The Chair: We need to come back to the business now.

Amanda Solloway: I add my appreciation for the NHS as well. I welcome the debate so far and look forward to continuing the discussion on this important Bill.

As part of the discussion on amendment 19, I will draw on two comments about failure in research that we heard in last week’s evidence sessions. The first is Bob Sorrell’s point that, compared with the US,

“there is a definite culture in the UK that failure is something that you hide under the carpet”.

He went on to say that ARIA

“is about establishing a culture in which we can accept failure and move on.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 76, Q79.]

My worry is that the amendment, which requires the publication of a statement containing information regarding ARIA’s tolerance to failure, just misses the point. Focusing on the number and value of project failures versus successes as an annual output risks creating the wrong mindset, and risks losing sight of the ambitious multi-year goals.

It is also the case that assessing the failure of programmes and projects on an annual basis might have the effect of limiting risk-taking over the longer term. A high-potential project might qualify as a failure after one year, even though it may deliver great results over the longer term.

The second comment was made by Professor Dame Ottoline Leyser, who questioned how we will know that ARIA has succeeded, and what one would expect the percentage failure to be. She said:

“There is also serendipity...to factor in. If you set yourself a fantastic target of solving a particular problem or producing a particular new product and you fail to do that, none the less, along the way you might discover something extraordinary that you can apply in another field.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 12, Q7.]

Although ambitious research goals might not ultimately be achieved, ARIA will generate value from failures and should therefore embrace failure, and there is value in knowing what does not work, as well as in the successes.

11.45 am

ARIA will also be a great convenor of talent that would not otherwise be brought together. It is through the serendipity that value arises, which would not be captured by the information that the hon. Lady’s amendment would require. I therefore urge her to withdraw the amendment.

Chi Onwurah: I thank the Minister for her remarks. We agree on the need for ARIA and for high-risk, high-reward research, but perhaps we differ on whether the publish share an understanding of that need. There are also, unfortunately, the realities of the environment in which we live: our culture does not have a high tolerance of failure. We truly believe that it is incumbent on us as parliamentarians and leaders to take what steps we can to help transform the situation and to not leave ARIA alone, so that we can all better understand the role that failure will play.

I am reluctant to detain the Committee. This was meant to be a constructive amendment, but if it has not met with the approval of the Minister, I am happy to beg to ask leave to withdraw the amendment.

Amendment, by leave, withdrawn.

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: It is absolutely vital that ARIA operates at the cutting edge of science and technology, and I have consistently heard from the scientific community that ARIA must tolerate the risk of failure to succeed. This idea gets to the very heart of what ARIA is about and on Second Reading there was also cross-party support for it, too.

ARIA will set highly ambitious research goals, which, if they are achieved, will bring about transformative scientific and technological advances, and those advances could also yield significant economic and social benefits. It follows that, as these goals are expected to be highly ambitious, it is likely that only a small fraction of them will be fully realised as originally intended, which will necessarily require a high tolerance of failure. For example, it might be that when some failures are judged over a longer time horizon, they will lead to unexpected successful outcomes. Clause 3 allows ARIA, in exercising its functions, to give particular weight to ambitious research, development and exploitation, which carry a high risk of failure.

I will just say a few words about failure. Although ambitious goals might not ultimately be achieved, ARIA will generate value from project failures. For example, a particular goal may not prove technologically viable, but in pursuing it scientists may happen across another promising technology or develop a new method of data collection. There is also value to be had in knowing what does not work, as well as in the successes.

ARIA is also expected to be a convener of high-calibre individuals and organisations from across the public and private sectors, which otherwise might not have been brought together. However, ARIA is not just about ambitious research goals. Clause 3 also allows ARIA to take greater risks in the form of the support it provides, including the use of innovation funding mechanisms. For example, clause 3 provides ARIA with the potential to take equity stakes in start-up ventures for the purpose of developing and exploiting scientific research.

That approach also extends to funding research and development that is untested and untried, and not necessarily peer-reviewed, which is a clear dividing line between ARIA and other public research and development funders, such as UK Research and Innovation. For ARIA to be a fruitful addition to the R&D funding landscape, it must be able to pursue truly ambitious

targets and to support them in a novel and sometimes risky way. It must not be scared of failure, and clause 3 seeks to enable that mindset and approach.

Chi Onwurah: We recognise that clause 3 is essential to enabling and empowering ARIA and ARIA executives in tolerating failure. That is part of ARIA, and the clause has our support.

On the exercising of functions in the Bill, following our debate on an amendment debated in the previous sitting, the Minister kindly sent me a letter about how the Secretary of State might consider removing the chair from their position. I thank the Minister for her comments that set out the way in which the chair might be removed. I point out that our amendment would have given powers to remove an executive member and the Bill only gives powers to remove a non-executive member, which is the issue we were concerned about.

Question put and agreed to.

Clause 3 accordingly order to stand part of the Bill.

Clause 4

GRANTS TO ARIA FROM THE SECRETARY OF STATE

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 4 creates a power for the Secretary of State to fund ARIA. The Committee will be aware that the Government have committed to funding ARIA with £800 million up to financial year 2024-25. The clause allows the Secretary of State to attach conditions to the grants made to ARIA, which will be set out in the framework document and funding delegation letter, which are agreed between my Department and ARIA. The documents will be drafted and agreed with ARIA's senior leadership team ahead of ARIA becoming operational in 2022.

The documents will complement the Bill, setting the broad parameters within which ARIA can operate and ensuring appropriate use of public money. It is a requirement for arm's-length bodies of Government Departments to have these arrangements in place. I will be exceptionally mindful that we do not tie ARIA up in knots with endless Government approval processes, as that would run counter to what ARIA is about, but some parameters must be put in place to safeguard the use of public money.

For example, I have spoken about the importance of providing ARIA's high-calibre programme managers with the freedom to experiment with a toolkit of funding methods in a way that best suits the programme goals and that does not always fund the usual suspects. As the policy statement sets out, that may include the use of inducement prizes, grant-prize hybrids and seed grants, taking equity stakes and so on. Some of ARIA's activities could be subject to delegation levels, which limit the amount of a single type of activity, for example. The ability to attach conditions to grants paid by the Secretary of State to ARIA will set the appropriate framework within which ARIA can then freely determine its activities and funding choices without ministerial interference.

Clause 4 is as significant in what it does not say as in what it does. Unlike the corresponding clause in the Higher Education and Research Act 2017, clause 4 does

not include a direction-making power regarding the allocation or expenditure of ARIA. This is important because the funding decision-making power should rest with ARIA, not Ministers. Clause 4, in allowing ARIA to be funded, is essential to its functioning and should stand part of the Bill.

Chi Onwurah: As the Minister said, clause 4 enables the Secretary of State to make grants to ARIA. It is clearly essential—what is the point of an agency that is not able to receive funds? While we do not oppose the clause, however, we are concerned about the general tone and language in the discussion of the way in which grants and funding will be made available to ARIA.

The Minister talked about not burdening ARIA with bureaucracy. At this time, there are a number of investigations into accusations of sleaze and the inappropriate ways that funding has been made available to the mates of different Secretaries of State. Funding and procurement have been carried on through WhatsApp groups, rather than through the normal procurement procedures, for example. I believe that the clause would have benefited from setting out more robustly the importance of the procedures, which are to be agreed, as well as the importance of what the Minister calls “bureaucracy” in enabling and ensuring trust, which is so very important for this agency.

In the debate on Tuesday, the Minister talked about a “different model of trust” for ARIA. I put on the record that the Opposition believe strongly that it is not the model of trust that is wrong, but the way in which it is being followed or implemented by this Government. We believe that the current model of trust needs to be supported in relation to ARIA and in all funding and procurement decisions.

Question put and agreed to.

Clause 4 accordingly ordered to stand part of the Bill.

Clause 5

NATIONAL SECURITY DIRECTIONS

Chi Onwurah: I beg to move amendment 20, in clause 5, page 2, line 33, at end insert—

“(4) The Secretary of State must, in relation to each financial year—

- (a) prepare a report in accordance with this section, and
- (b) provide a copy of it to the Intelligence and Security Committee of Parliament as soon as is practicable after the end of that period.

(5) Each report must provide details of—

- (a) any directions made under this section in the relevant financial year, and
- (b) the nature of the national risks posed which triggered the making of the directions.”

This amendment would require the Secretary of State to prepare and provide to the ISC an annual report on any directions made under this section.

It is a great pleasure to move this amendment, which proposes an essential addition to the Bill. It would require the Secretary of State to prepare and provide to the Intelligence and Security Committee of Parliament an annual report on any direction made under the clause. I remind the Committee that clause 5 states that

“(1) The Secretary of State may give ARIA directions as to the exercise of its functions if the Secretary of State considers it necessary or expedient in the interests of national security. (2) The power to

give directions under this section includes power to vary or revoke a direction. (3) ARIA must comply with a direction given under this section.”

We in the Labour party are very clear that we are the party of national security—*[Interruption.]* Would anybody like to intervene? Let me say it again: we are the party of national security, and we believe that it is vital that decisions taken by the Government reflect our national security interests. That is clearly in the interests of the nation. The first duty of any Government, of any colour, is to keep our nation secure, and we are very pleased that the Bill recognises the importance of national security. Indeed, we are often concerned that, at times, it seems that this Government place business interests, particularly foreign investment, ahead of national security.

Obviously, national security is an important consideration, but the issue and the challenge here is that, under the Bill as drafted, those directions cannot be subject to adequate parliamentary scrutiny. I am reluctant to remind the Committee again, but the Government are in the midst of a cronyism scandal. The Bill places power and responsibility in the hands of the Secretary of State, with little ongoing accountability generally. Part of our constructive approach to the Bill is to try to ensure that there is appropriate scrutiny provision throughout the Bill, particularly given that it was drafted before the cronyism scandal that has had such an impact on the public’s trust in procurement, funding and other decisions taken by this Government.

12 noon

It is essential that the directions that the Secretary of State gives be subject to scrutiny, but how will that be possible under the Bill as it stands? A Select Committee does not have the intelligence clearance to discuss matters of national security. I hope that it is in order for me to remark that I have had the good fortune to work on the National Security and Investment Bill and the Telecommunication (Security) Bill as they have come through Parliament in the last few months. In both Bill Committees, we discussed the issue of a Secretary of State taking decisions on grounds of national security. By definition, those decisions would not be able to be subject to scrutiny, because only the Intelligence and Security Committee of Parliament has the intelligence clearance to scrutinise such decisions. By enabling that scrutiny, we want to correct the oversight of giving to the Secretary of State powers that are not subject to scrutiny.

The reports that we are proposing would be annual, coinciding with the financial year, and would provide Parliament with an accurate and periodic update on the impact of these measures on our national security. The Bill allows the Secretary of State to take decisions in the name of national security, but without any obligation to inform or liaise with the ISC. If the Minister objects to the way that the report would be required, we are quite happy to discuss other ways in which the ISC can provide the appropriate scrutiny.

The Department for Business, Energy and Industrial Strategy does not have a long-standing tradition of implementing national security measures. It was only very recently, with the National Security and Investment Bill, for example, which has yet to complete its stages in the House, that BEIS was given the powers to look at mergers and acquisitions and so on based on national

security. We believe that experienced and qualified oversight is needed. If the Minister is reluctant to support the amendment, I would like to hear from her how the Secretary of State's powers will be scrutinised.

Duncan Baker (North Norfolk) (Con): I thank the hon. Lady for giving way. I am intrigued by the amendment, because on the one hand, the Opposition were very keen with amendment 15 that ARIA's mission be to drive the net zero agenda; on the other hand, this amendment would require the Secretary of State to report to the ISC. Can she explain where she thinks a report on the potential for net zero to the ISC would be necessary and what it would achieve?

Chi Onwurah: I thank the hon. Gentleman for his intervention, which I hope does not reflect a lack of understanding of the ways in which science research and our national interest work. On national security, a direction could be given to ARIA not to work in nuclear energy with a Government whose interests did not align with our own, for example. That is quite a relevant example, because we know that, rather than investing in it themselves—even though interest rates are so low at the moment—the Government have welcomed, and even encouraged, investment in our nuclear energy by the Chinese. Some kind of direction might well be given on that basis. There are many ways in which climate change is essential to our national security, so I do not think that example was very well chosen.

More generally, if the hon. Member is asking how trade-offs between national security and other priorities should be made, which is a very important question, we have already said that we believe in national security, and national security should always be the priority. However, when such a direction is made for reasons of national security, which we support, the fact is that we will not know why it was made. Perhaps that is right, because if it is an issue of national security, those concerns should not be shared publicly; none the less, somebody needs to scrutinise them. I hope everybody on this Committee will agree that someone in Parliament should be scrutinising decisions on national security, particularly when those decisions are taken by the Secretary of State for Business, Energy and Industrial Strategy. As I have already said, neither the Department nor the Secretary of State has long experience of making national security decisions.

Daniel Zeichner: I fully take the point made by the hon. Member for North Norfolk, but we Opposition Members have a degree of prescience in being able to predict the way that votes in this Committee might go. We anticipated that the Government might not accept our suggestion about giving ARIA this mission. Does not that the lack of a mission create this further problem? If we had had that clear mission around climate, this would be far less of an issue.

Chi Onwurah: Once again, my hon. Friend raises an excellent point, and indeed he brings together the themes of our amendments. He is right to say that if ARIA had a clear mission, there would be better understanding of the kinds of decisions and trade-offs that might well need to be made, and we could have a much better informed discussion around that. However, the fact is that we have neither a mission for ARIA, nor any opportunity

to scrutinise the national security directives that might be made in the interests of addressing climate change, but also might be made in the interests of ensuring that we have oil drilling rights, or that we continue to fund minerals extraction around the world in order to support other research objectives. It is clear to us that we need to have this scrutiny.

As I indicated, there have been a number of debates on Intelligence and Security Committee scrutiny of other Departments, including in relation to the National Security and Investment Bill and the Telecommunications (Security) Bill. In those cases, despite that Committee being keen to scrutinise national security decisions, the Government have shown a great reluctance to allow parliamentary scrutiny of issues of national security. Some believe—I am not one of those cynical people—that this is because the Government are not happy with Parliament's choice of Chair of the ISC. I am loath to believe that the Government would be so petty when it comes to such an important matter as national security, so I hope the Minister will clarify how we will have appropriate scrutiny of national security decisions made by the Secretary of State, as set out in this Bill, and why the ISC is not the right vehicle for that.

I will finish with two brief quotes in support of the amendment. In the National Security and Investment Bill Committee, we had the great privilege of taking evidence from Richard Dearlove, former head of the British Secret Intelligence Service.

He said:

"My view would be that the annual report has as much transparency as possible, but you are probably going to require a secret annexe from time to time. It is a bit like the reports of the Intelligence and Security Committee, which I dealt with frequently as chief. They and we were keen that they should publish their reports, but there comes a point where it is not in our national interest that some of this stuff is put in the public domain."

—[*Official Report, National Security and Investment Public Bill Committee*, 24 November 2020; c. 21, Q23.]

That is the case here as well.

My right hon. Friend the Member for North Durham (Mr Jones) has said:

"I do not want to give the impression that the ISC is looking for work, because I have been a member for a number of years and we are busy with a lot of inquiries—I have three or four hours' reading every week looking through reports from the agencies. However, it is important that the ISC can at least look at the intelligence that lies behind decisions."—[*Official Report, Telecommunications (Security) Public Bill Committee*, 21 January 2021; c. 143.]

That is all that we are seeking to achieve through this amendment.

Amanda Solloway: Amendment 20 would require the Secretary of State to provide a report to the Intelligence and Security Committee at the end of each financial year detailing directions made by the Secretary of State to ARIA in the interests of national security and the national security risks that triggered the directions.

The Government take very seriously their duty to protect the national security of the country and its citizens. The ISC plays a valuable role in providing scrutiny and expertise in respect of its functions, as set out in the Justice and Security Act 2013 and the statutory memorandum of understanding. However, that remit does not extend to oversight of BEIS work.

I do not see any reason why such a report should be necessary. No such arrangements exist with UKRI through the Higher Education and Research Act 2017. Instead, the organisation has robust national security arrangements in place to ensure that appropriate action is taken. Similar arrangements will be put in place as ARIA becomes operational, and we are speaking with the relevant parts of Government to make sure that that is the case.

The clause reflects the fact that, while ARIA will be free from ministerial interference, we will always act on our responsibility to protect our national security. Information made known to the Secretary of State will be fed into the wider work of the Government to protect UK R&D from national security risks as appropriate. I see no case for ARIA to report on that to the ISC. I urge the hon. Lady to withdraw her amendment.

Chi Onwurah: I thank the Minister for her comments, but she has not responded to the underlying and constructive aim of the amendment, which is to ensure that the ISC has sight of intelligence and security decisions.

She makes a comparison with UKRI. This agency is about high-risk, high-reward research, which we are told will be transformative. During many of our National Security and Investment Bill Committee debates, the point was raised that the nature of national security threats is changing and, as we heard numerous times in evidence, has moved, and is moving, very much into the technological domain. The question whether or not we play a leading role in artificial intelligence, for example, is an issue of national security, as are our cyber defences, which I am sure any chief executive of ARIA would be keen to look at. The agency needs the kind of intelligence scrutiny that only the Intelligence and Security Committee can give. On that basis, I would like to press the amendment to a vote.

12.15 pm

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 9.

Division No. 14]

AYES

Blackman, Kirsty
Butler, Dawn
Flynn, Stephen

Furniss, Gill
Onwurah, Chi
Zeichner, Daniel

NOES

Baker, Duncan
Crosbie, Virginia
Fletcher, Mark
Hunt, Jane
Mayhew, Jerome

Metcalfe, Stephen
Richardson, Angela
Solloway, Amanda
Tomlinson, Michael

Question accordingly negated.

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 5 creates a power for the Secretary of State to give directions to ARIA regarding the exercising of its functions that are considered necessary or expedient in the interests of national security. It is right that ARIA is free from too much ministerial oversight. However, when it comes to questions of national security, Ministers may intervene to prevent risk to the UK's national security interests.

The necessary and expedient threshold of clause 5 offers adequate protection and limits the possibility of ministerial overreach, owing to a more broadly defined power. The direction-making power with which ARIA must comply can be general—for example, a direction not to conduct research in conjunction with partners from a particular jurisdiction that poses a threat to the United Kingdom's national security—or specific: for example, a direction to terminate a specific contract.

Subsection (2) states that the directions include the “power to vary or revoke”,

which is to say that directions can be altered or withdrawn depending on how the national security risk develops or subsides.

I would like to take this opportunity to assure the Committee that my team are working hard to ensure that ARIA is set up with national security risks front of mind. That ranges from reducing the risk of cyber-attacks, to ensuring that ARIA is plugged to the appropriate Whitehall national security networks. This work complements a direct-making power in the Bill.

Chi Onwurah: As I have said, Labour is the party of national security.

Jerome Mayhew (Broadland) (Con): The hon. Lady has said on a number of occasions that Labour is the party of national security. I would be very interested to hear her views about what date it became the party of national security. If my memory serves me right, Sir Richard Dearlove, to whom the hon. Lady has referred approvingly, said that the former leader of the Labour party, the right hon. Member for Islington North (Jeremy Corbyn), was a personal risk to national security, particularly if he ever got the keys to No. 10. He said:

“Do not even think of handing this politician the keys to No10.”

If that was the Labour party's approach under his leadership, at what stage did it change its mind about national security?

Chi Onwurah: I am really disappointed in the hon. Gentleman for trying to make our national security an issue of party politics, and in particular for quoting a supposed critique of politicians by our intelligence service from previous years. I do not think that such comments have a place in this debate. We have elected leaders. I could go into a long list of quotations about our current Prime Minister and the concerns that he raises in many people's minds, including from when he was Foreign Secretary.

The Chair: I think we should stick to the business at hand.

Chi Onwurah: I recognise that, Mr Twigg, but let us be clear. When I say that we are the party of national security, it is also what the shadow Secretary of State for Defence and my party leader say. That is a statement, and I really do not think it was appropriate of the hon. Member for Broadland to try to undermine the unity on both sides of the House with regard to the importance of national security. I fear that that is what he was trying to do.

[Chi Onwurah]

As I was saying, Labour is the party of national security and believes strongly in the importance of the Secretary of State's ability to give directions informed by national security. However, I feel that the Minister has yet to set out how those directions will be scrutinised. That remains a significant concern for the Opposition if we are to be sure that those directions are really driven by our national security interests and if we are to give the scrutiny that ensures continuing public confidence. However, given the importance of national security, we will clearly not be opposing clause 5.

Question put and agreed to.

Clause 5 accordingly ordered to stand part of the Bill.

Clause 6

INFORMATION

Kirsty Blackman (Aberdeen North) (SNP): I beg to move amendment 27, in clause 6, page 2, line 38, at end insert—

“(2) ARIA must provide relevant Select Committees of the House of Commons and the House of Lords with such information as the Select Committees may request.”

This amendment is intended to allow relevant parliamentary Select Committees to access information in order to scrutinise the value for money provided by ARIA.

I will not say a huge amount about the amendment, which pretty much speaks for itself. As ARIA is not subject to freedom of information, I think it incredibly important that there should be a commitment from the Minister that ARIA will provide information to Select Committees if they request it. If the Minister will stand up and say that ARIA will of course provide information to Select Committees, I will withdraw my amendment post haste.

Amanda Solloway: Amendment 27 would require ARIA to provide information requested by relevant Select Committees in both Houses. Sufficient measures are already in place to ensure that Select Committees have access to information that would allow them to scrutinise the work of Government Departments and public bodies.

I agree that Select Committees play an important role in examining the work of arm's length bodies, and I am grateful for the interest and insight that the Science and Technology Committees in both Houses have had into ARIA so far. However, the Osmotherly rules provide guidance for how Government Departments and public bodies should interact with Select Committees. They are clear that the members of arm's length bodies should be as helpful as possible in providing accurate, truthful and full information when giving evidence, taking care to ensure that no information is withheld that would not be exempted if a parallel request were made to the body under the Freedom of Information Act 2000. I believe that that is sufficient to ensure co-operation and a constructive relationship between ARIA and relevant Select Committees, as it is for other bodies such as UKRI.

On scrutiny of ARIA's value for money, as was set out in discussions on schedule 1 the National Audit Office can conduct value-for-money assessment in the usual way. I wanted to address a comment made by the hon. Member for Newcastle upon Tyne Central on

Tuesday about the role of the National Audit Office in scrutinising the work of ARIA. I do not agree that the safeguard is very limited; in fact, value-for-money assessments are rigorous and robust, and provide the basis for the Public Accounts Committee's hearings and reports. I therefore believe that the right arrangements are in place for Select Committees to scrutinise the work of ARIA. That is in line with standard practice. I hope that the hon. Member for Aberdeen North will withdraw her amendment.

Kirsty Blackman: I thank the Minister for her statement. She has made it clear that she expects ARIA to comply and not withhold information necessary for Select Committees. I beg to ask leave to withdraw the amendment.

Amendment, by leave, withdrawn.

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 6 focuses on the Secretary of State's information rights with respect to ARIA. The Secretary of State may request information relating to his or her functions—for example, information required to determine the Government's funding of ARIA, to make national security directions, or for the appointment or removal of board members. It is important that the Secretary of State has the information that he or she requires to perform relevant functions.

The information rights remain limited compared with the other arm's length bodies of Government Departments. The Bill does not allow the Secretary of State to request ARIA's strategy or delivery plan, for example, as the Higher Education and Research Act 2017 does with respect to UKRI. A limited set of information rights is an important feature of maintaining ARIA's independence from Government, and it also helps the body to be an agile organisation that can focus on high-risk, high-reward research.

I remind the Committee that this is not the extent of the information provided by ARIA. As we have discussed with respect to schedule 1, for example, ARIA must also send a copy of its statement of accounts and annual report to the Secretary of State, to be laid before Parliament. It is also in the gift of the Secretary of State to oblige ARIA to make other types of information available—via the framework document, for example—as a condition of funding under clause 4. Clearly, it is important to strike a balance between transparency in the use of public moneys and not operationally overburdening a small organisation.

The clause also sets out stipulations regarding the handling of information. Disclosure of information by ARIA under the clause does not breach any obligation of confidence owed by ARIA, and does not, for example, require a disclosure of information should it contravene data protection legislation. I hope that hon. Members agree that the information rights set out in the clause are important to allow the Secretary of State to carry out their functions effectively.

Chi Onwurah: I thank the Minister for summarising clause 6. The theme of many of our amendments has been the importance of communication, information, understanding ARIA and its mission, and accountability, so we support the requirement for information to be

provided by ARIA to the Secretary of State as appropriate. The duties in the clause seem entirely appropriate, but I have a couple of concerns that I hope the Minister will either respond to or perhaps write to me about.

Clause 6(3) states:

“A disclosure of information required under this section does not breach—

- (a) any obligation of confidence owed by ARIA, or
- (b) any other restriction on the disclosure of information (however imposed).”

Perhaps this is something that I should already understand, but I am not clear whether commercial confidentiality would come under subsection (3). If ARIA were funding, as I hope it will, a high-risk, high-reward and sensitive project, would that be excluded on the grounds of commercial confidentiality? There is no requirement for the information that ARIA provides to the Secretary of State to be published or shared more broadly, so I would hope that commercially confidential information could be shared.

Subsection (4) states:

“This section does not require a disclosure of information if the disclosure would contravene the data protection legislation.”

Clearly, if disclosure contravened data protection legislation, it would be illegal, so I am somewhat confused about a requirement on ARIA not to break existing laws. I am happy for the Minister to write to me to say under what circumstances there might be a need to share information, the disclosure of which would contravene data protection legislation. I can only think that it might involve personal information, which suggests that the Secretary of State would ask for personal information. Earlier, we discussed the gender pay gap and disclosing information on that. Did the Minister think that that might contravene data protection legislation if, for example, only women worked for ARIA?

Those are my concerns, and I would be obliged to the Minister if she wrote to me about those questions, but we will not oppose the clause standing part.

12.30 pm

Question put and agreed to.

Clause 6 accordingly ordered to stand part of the Bill.

Clause 7

TRANSFER SCHEMES

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: The clause introduces schedule 2, which contains provisions about schemes for transfer of staff, property, rights and liabilities to ARIA. It is very straightforward.

Question put and agreed to.

Clause 7 accordingly ordered to stand part of the Bill.

Schedule 2

TRANSFER SCHEMES

Question proposed, That the schedule be the Second schedule to the Bill.

Amanda Solloway: The schedule allows the Secretary of State to make one or more property or staff transfer schemes to ARIA. The permitted transferors are the Secretary of State or UKRI. The supplementary powers are standard and mirror those in, for example, the Higher Education and Research Act 2017. The principal purpose of clause 7 and schedule 2 is to ensure that important assets and personnel can be transferred from BEIS or, if required, UKRI, as ARIA is set up. For example, the chief executive officer and chair may be temporarily contracted to BEIS before ARIA becomes operational. It is administratively convenient to be able to use the power to transfer those staff to ARIA. Paragraph (4) provides that

“A staff transfer scheme may make provision which is the same as or similar to the TUPE regulations.”

That means that employers’ rights of transfer remain the same.

Alternatively, in the ARIA set-up phase, contracts may be entered into for an office lease or seed funding, which could be transferred to ARIA without contract novation. That means that the benefit and burden of the contract can be assigned to ARIA without having to obtain a third-party agreement. It is an important provision that may be needed to make ARIA operational.

Question put and agreed to.

Schedule 2 agreed to.

Clause 8

POWER TO DISSOLVE ARIA

Kirsty Blackman: I beg to move amendment 38, in clause 8, page 3, line 21, at end insert—

“unless they are made under subsection (7)”.

This amendment ensures that ARIA cannot use its significant resources to fund weapon development.

The Chair: With this it will be convenient to discuss amendment 37, in clause 8, page 4, line 4, at end insert—

“(7) The Secretary of State must immediately dissolve ARIA if it uses any of its resources to support weapon development.”.

This amendment ensures that ARIA cannot use its significant resources to fund weapon development.

Kirsty Blackman: It is important to consider the amendments together as one is consequential on the other. They would ensure that ARIA cannot use its significant resources to fund weapon development, and would provide the mechanism of the Secretary of State immediately dissolving ARIA were it to use any of its resources to support weapon development as an addition to the clause on dissolving ARIA. It is no secret that we in the SNP are not particularly keen to continue to be part of either the UK or the UK Parliament, but while we are contributing to ARIA and while some of our tax money is going to ARIA—while this money is being spent in our name—we do not want it to be spent on weapons or the development of weapons.

We have been very clear that we will not have nuclear weapons in an independent Scotland. We stand in opposition to them. For that reason, like many people in my party, I am a long-time member of the Scottish Campaign for Nuclear Disarmament. The decisions the UK Government have taken on the renewal of those weapons and on spending money on nuclear weapons have been some of the very worst things that they have

[Kirsty Blackman]

done in the name of the people of the UK. I do not want to sit on a Bill Committee that creates an organisation which has no set purpose, but which could entirely fund weapon development with the money that it is allocated. It could entirely fund research into technologies with which I fundamentally disagree.

Stephen Metcalfe (South Basildon and East Thurrock) (Con): I completely understand the hon. Lady's principled position on this issue. Does she not accept that, if the amendments were to pass, they would hamper the ability of the Secretary of State to activate clause 5 and direct ARIA towards working in our national security in a time of crisis? I fully accept that it would not be a good idea for ARIA to set its sights on developing new weapons, but we should not take its ability to do that away when we as nation may need it.

Kirsty Blackman: I thank the hon. Member for his characteristically sensible intervention. However, I feel so strongly about this that I think it is important that ARIA is excluded from doing that. There are other means that the UK can use to fund weapon development. I do not think ARIA should be one of them.

We are particularly concerned because of the lack of transparency and the issues that there have been around the use of weapons and the use of UK resources on weapons. We have said that we want the UK to immediately halt all military support and arms sales to regimes that are guilty of violations of human rights and international humanitarian law. The UK Government have not done so. Our concerns are well founded, which is why we have tabled what is quite an extreme amendment in comparison with others we have seen.

This is a subject of much moral debate. We will not ever accept the use of lethal autonomous weapons. Our concern is that, as they are on the cutting edge of technology, ARIA may consider looking at those weapons. I do not want that to be done in the name of the people I represent; they certainly do not want it done in their name.

The Minister has told us about the memorandum of understanding that will be in place between BEIS and ARIA. We have already touched on the issues of ethical investments that ARIA may or may not make. If the Minister was willing to make a statement about the ethical nature of investments ARIA will make and the direction that may be put into that MOU—we do not have as much information as we would like on the MOU—that might give us some comfort on the direction that ARIA may take. The lack of a mission for ARIA means that it is open to the possibility that this situation could arise, and that is a big concern of ours.

Amanda Solloway: Amendments 37 and 38 challenge so-called dual-use research—research that is intended for benefit, but might be misapplied by a third party to do harm. The ways in which that could be done will not always be easy to predict, and given the possible benefits of the intended civilian application, it would not be right to close the door to any research that might fall into that category.

I assure the hon. Member that, alongside the Bill, my team is working hard to ensure that ARIA is set up with such risks at the front of people's mind, including

regarding how ARIA is equipped to perform due diligence on potential research partners to minimise risk. It would not be right to dissolve ARIA immediately if it had taken all necessary precautions to minimise the inappropriate use of its research, which would be the effect of the amendments.

Clause 5 will allow the Secretary of State to give directions to ARIA relating to the exercise of its functions when that is necessary or expedient in the interests of national security. That would apply, for example, if ARIA worked with a researcher in another jurisdiction on the development of a technology that could be used by another country for nefarious ends such as weapons development. In that event, the Secretary of State could direct ARIA to cease the contract or research. Under schedule 1, the Secretary of State is able to remove members from office on national security grounds.

I emphasise that while we have learned from DARPA in creating ARIA, ARIA differs from DARPA in several ways, principally because it is not set up with a focus on defence or weapons development. I urge the hon. Member to withdraw the amendment.

Kirsty Blackman: I thank the Minister for her statement. I listened to it closely, and it did give some comfort about the possible direction of ARIA. Given what she said, I do not intend to press the amendment to a Division, but we will keep a close eye on what happens. When we scrutinise ARIA, we will examine whether it uses significant portions, or indeed any, of its resources to fund weapons development, especially in countries where there is concern about use for nefarious purposes—not that weapons can generally be used for a particularly good purposes—and with regard to lethal autonomous weapons. I beg to ask leave to withdraw the amendment.

Amendment, by leave, withdrawn.

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 8 allows the Secretary of State to make provision by regulation for the dissolution of ARIA

“ten years after the date on which this Act is passed.”

Before making such regulations, the Secretary of State will be required to consult ARIA and other persons he or she considers appropriate, who could include the recipients of ARIA funding or other experts in the field. That will ensure that those leading ARIA at the time will have the opportunity to contribute to the decision. As is set out in clause 11, regulations under clause 8 are subject to the affirmative procedure in each House of Parliament.

We recognise that ARIA is a new body that will take time to get up to scale and demonstrate success. Its exclusive focus on high-risk, programme-led research requires patience, so it should not be evaluated on short-term outcomes. The Commons Science and Technology Committee and the R&D sector at large have welcomed the long-term, patient approach that has been set out for ARIA, and the dissolution grace period is designed to take account of that. There is no obligation to exercise the dissolution power after 10 years, and the Government are, of course, optimistic that clause 8 will not be needed. However, we recognise that ARIA represents a new way of funding research so, as a matter of good administration, we have provided for a power to dissolve ARIA in the event that it is not successful.

Question put and agreed to.

Clause 8 accordingly ordered to stand part of the Bill.

Clause 9

CONSEQUENTIAL AMENDMENTS

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 9 introduces consequential amendments to schedule 3, which we will go on to discuss. It has no other effect, and I hope that hon. Members agree with its necessity.

Question put and agreed to.

Clause 9 accordingly ordered to stand part of the Bill.

Schedule 3

CONSEQUENTIAL AMENDMENTS

12.45 pm

Chi Onwurah: I beg to move amendment 21, in schedule 3, page 13, line 37, leave out paragraph 11.

This amendment would remove ARIA's exemption from the Public Contracts Regulations 2015.

Amendment 21, which stands in my name and those of my hon. Friends, is a key amendment that will ensure that ARIA merits and deserves the confidence of the public at this time of great debate about sleaze and cronyism. The amendment would remove ARIA's exemption from the Public Contracts Regulations 2015. As drafted, paragraph 11 of schedule 3 excludes ARIA from the definition of a "contracting authority" under the 2015 regulations; as a consequence, ARIA is exempted from the usual public procurement rules. The Opposition do not understand why ARIA's exemption from those rules is justified. Indeed, we are truly concerned that exempting it in this way opens a side door to sleaze in science.

Dawn Butler (Brent Central) (Lab): My hon. Friend is absolutely correct in her presentation: we fail to understand why ARIA is exempt from the Public Contracts Regulations 2015. The Government are embroiled in the PPE and VIP lane scandals. It has been exposed that companies were put into the VIP lane by mistake—for example, PestFix was awarded £32 million. For ARIA to be exempted from any regulation risks this exploding to a larger extent with £800 million of public funds.

Chi Onwurah: I thank my hon. Friend for her intervention, and she is absolutely right. It would be a cause for concern at any time to exempt an agency of this importance and public funding from procurement rules, but it is particularly worrying when the Government are already embroiled in a cronyism and procurement scandal.

In support of the point that my hon. Friend made, Transparency International—a well-known and reputable organisation—found that, of 1,000 procurement contracts signed during the pandemic and totalling £18 billion of public money, one in five had one or more of the red flags commonly associated with corruption. Is that not a figure of which we should be absolutely ashamed? That has happened within the existing rules, and the Minister proposes to exempt ARIA from those rules.

In her letter to the Chair of the Science and Technology Committee on 2 March 2021, the Minister explained that the Bill will

“provide ARIA with an exemption from Public Contracts Regulations so that it can procure services, equipment and works relating to its research goals at speed, in a similar way to a private sector organisation.”

We have several concerns about that explanation. What assessment has the Minister made of the ways in which private sector organisations procure services? Has she compared this with the success or otherwise of Government procurement processes for PPE during the covid crisis? Is she saying that private sector procurement is more effective, more honest and fairer; or is it simply quicker?

What the exemption is for is also a concern. The Minister implies that it is for services, equipment and works relating to ARIA's research goals. Is it for equipment, services and works, or is it actually for research? Will ARIA be considered to be procuring research? We had been led to understand that it would be a funder of research and development, not a body conducting its own research in a lab, so what actual procurement needs will it have, beyond office space and office equipment? There are months and months before ARIA is operational, so what will it need to procure at speed, or is the intention to enable ARIA to procure research without oversight? What is the justification for not having appropriate oversight for its procurement of research?

We absolutely understand, and support, providing ARIA with additional flexibility in terms of its funding activity, but the benefit of exempting ARIA's procurement of goods and services is not clear. We suggest that ARIA's procurement needs are not different from those of other Government funding bodies. We hope that the Minister will explain why that is the case. In terms of safeguards, the Government are proposing that in a future framework agreement BEIS will require ARIA to appoint an independent internal auditor to report its procurement activities. It is therefore going to have an internal bureaucracy, as the Minister puts it, rather than be subject to the procurement rules that have been developed, debated and put in place over time.

Will that framework agreement set out procurement rules for ARIA? Otherwise, what is the auditing requiring compliance with? How can we audit if there are no rules to benchmark against? Without safeguards, we have significant concerns about the risk of sleaze. What is to prevent ARIA from buying its office equipment from a mate of the Secretary of State or of the chief executive? Can the Minister say which of the regulations she objects to? The Public Contracts Regulations 2015, for example, state that a person awarded a public contract must

“be linked to the subject-matter of the contract.”

Does she object to that? What will prevent ARIA from operating effectively?

In the evidence sessions, we heard a number of times, including from Professor Glover, that there is a need for openness and transparency. David Cleevly said:

“The more open you are about what you are doing, the less easy it is to hide the fact that you have let particular contracts and so on, so there ought to be a mechanism within the governance structure of the agency to do that.”—[*Official Report, Advanced Research and Invention Public Bill Committee*, 14 April 2021; c. 75, Q78.]

[*Chi Onwurah*]

The Minister is removing such mechanisms as there already are. We heard that having rules and regulations in place was part of the culture of DARPA, on which this agency is supposedly based, with one of its directors, Dr Highnam, saying:

“Honour in public service is top of the list.”—[*Official Report, Advanced Research and Invention Public Bill Committee*, 14 April 2021; c. 39, Q32.]

Stephen Metcalfe: Did we not also hear from Director Highnam how DARPA benefits from other transaction authority and the flexibility that comes outside of the standard Government procurement process?

Chi Onwurah: We heard from Dr Highnam repeatedly of the importance of rules and regulations. He spoke specifically of a culture in which the process was not considered bureaucracy and a barrier but part of enabling DARPA to meet its obligations. I say to the hon. Member for South Basildon and East Thurrock, for whom I have a great deal of respect, that the flexibility that DARPA benefits from in being able to procure research is not outside the United States procurement requirements. Dr Highnam made it clear that they benefit from providing extraordinary results while being open and following the highest standards in public service.

I hope that the Minister will agree to leave ARIA with public procurement rules that provide some measure of trust, particularly in the middle of the current cronyism scandal.

Angela Richardson (Guildford) (Con): It is a pleasure to serve under your chairmanship, Mr Twigg.

If procurement rules for the traditional R&D granting used by UKRI do not apply, we need to understand that ARIA, like DARPA, will work differently. There will be some granting, but others will be commissioned and contracted to conduct research. If ARIA often procures R&D services, they could be within the scope of procurement regulations, so it is important to have the exemption. My hon. Friend the Member for South Basildon and East Thurrock made a good point when he referenced the evidence that DARPA deputy director Dr Highnam gave last Wednesday about how DARPA benefits from other transaction authority and has flexibility outside the standard Government-contracting standards. Those flexibilities exist in the US and it is important that ARIA has a similar flexibility.

The exemption places freedom in the hands of the leaders and programme managers. In that model, those programme managers will be recruited to run ARIA as an independent body. ARIA's procurement will be at arm's length from Government and Ministers.

Importantly, in paragraph (14) to schedule 1, the Government have made a commitment to ensure that ARIA internally audits its procurement activities. The upfront flexibility that the exemption affords will be balanced by reporting at a later point. It is clear that the need for agility does not negate ARIA's accountability.

Stephen Flynn (Aberdeen South) (SNP): I will briefly highlight our view of amendments 21 and 22. We are considering perhaps some of the daftest things that the UK Government have proposed in my short time in the House. I cannot quite believe that we are in a situation

whereby public contracts and freedom of information are simply brushed to one side by a Government. I am interested by the argument that we should follow DARPA's example in procurement practices, but not when it comes to having a mission. The Government seem to have picked the worse of the two options, and that is bizarre.

The shadow Minister rightly covered the matter in detail. Last week, one of the expert witnesses said that transparency fosters trust. Why would any Government not want the trust of Parliament and the people?

Amanda Solloway: The amendment would omit the extension of obligations on contracting authorities for the purposes of public contracts regulation that the Bill affords ARIA. I will take the opportunity to explain to hon. Members why the extension is so important.

I will make three points. First, ARIA is expected to commission and contract others to conduct research in pursuit of its ambitious goals. ARIA will often be procuring those services, and that commissioning and contracting is a fundamentally different way of funding R&D from traditional grant-making, where procurement rules do not apply.

1 pm

Secondly, that way of funding research is core to DARPA's approach, the successful US model we have learned from in designing ARIA. There has been some confusion on that point. As Dr Peter Highnam made clear in his evidence to the Committee, DARPA benefits from what he described as “other transaction authority”, which offers flexibility outside standard US Government contracting standards. For ARIA to take the innovative new funding approach that is so fundamental to its objectives, I believe that it will benefit from similar flexibilities here. For ARIA, the public procurement rules could prevent a critical investment being made at speed or at all. We will therefore provide that exemption so that ARIA may procure services, equipment and works relating to its research goals at speed, in a similar way to a private sector organisation.

Finally, there has been some discussion in Committee about trust in Government. I will therefore stress that that exemption places freedom into the hands of ARIA and the leaders and programme managers who will be recruited to run it as an independent body. That independence, as I have been clear throughout, is essential.

Stephen Flynn: I am very much in favour of freedom, for want of a better phrase, but does the Minister not understand the concerns that the public will have about transparency on such a key amount of public money? That is something the Government have an awful track record on at this moment in time. Does she not understand the public's view?

Amanda Solloway: I make reference to all the methods that we have in place to ensure that we are transparent in the running of ARIA. As I have been clear about throughout, independence is an essential feature of ARIA. Its procurement will therefore be at arm's length from Government and Ministers. I hope that this debate has demonstrated the necessity of such an arrangement and that the hon. Member for Newcastle upon Tyne Central will withdraw her amendment.

Chi Onwurah: I thank the Minister for her response, but I do not feel reassured and I do not think that the public will feel reassured. I will therefore press the amendment to a vote.

Question put, That the amendment be made.

The Committee divided: Ayes 6, Noes 8.

Division No. 15]

AYES

Blackman, Kirsty
Butler, Dawn
Flynn, Stephen

Furniss, Gill
Onwurah, Chi
Zeichner, Daniel

NOES

Baker, Duncan
Crosbie, Virginia
Fletcher, Mark
Mayhew, Jerome

Metcalfe, Stephen
Richardson, Angela
Solloway, Amanda
Tomlinson, Michael

Question accordingly negatived.

Ordered, That further consideration be now adjourned.
—(Michael Tomlinson.)

1.3 pm

Adjourned till this day at Two o'clock.

PARLIAMENTARY DEBATES

HOUSE OF COMMONS
OFFICIAL REPORT
GENERAL COMMITTEES

Public Bill Committee

ADVANCED RESEARCH AND INVENTION AGENCY BILL

Sixth Sitting

Thursday 22 April 2021

(Afternoon)

CONTENTS

SCHEDULE 3 agreed to.
CLAUSES 10 TO 15 agreed to.
New clauses considered.
Bill to be reported, without amendment.

No proofs can be supplied. Corrections that Members suggest for the final version of the report should be clearly marked in a copy of the report—not telephoned—and must be received in the Editor’s Room, House of Commons,

not later than

Monday 26 April 2021

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The Committee consisted of the following Members:

Chairs: JUDITH CUMMINS, †MR PHILIP HOLLOBONE, ESTHER McVEY, DEREK TWIGG

- | | |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| † Baker, Duncan (<i>North Norfolk</i>) (Con) | † Onwurah, Chi (<i>Newcastle upon Tyne Central</i>) (Lab) |
| † Bell, Aaron (<i>Newcastle-under-Lyme</i>) (Con) | Owen, Sarah (<i>Luton North</i>) (Lab) |
| † Blackman, Kirsty (<i>Aberdeen North</i>) (SNP) | † Richardson, Angela (<i>Guildford</i>) (Con) |
| Butler, Dawn (<i>Brent Central</i>) (Lab) | † Solloway, Amanda (<i>Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy</i>) |
| † Crosbie, Virginia (<i>Ynys Môn</i>) (Con) | † Tomlinson, Michael (<i>Lord Commissioner of Her Majesty's Treasury</i>) |
| † Fletcher, Mark (<i>Bolsover</i>) (Con) | † Zeichner, Daniel (<i>Cambridge</i>) (Lab) |
| † Flynn, Stephen (<i>Aberdeen South</i>) (SNP) | |
| † Furniss, Gill (<i>Sheffield, Brightside and Hillsborough</i>) (Lab) | |
| Hunt, Jane (<i>Loughborough</i>) (Con) | Sarah Ioannou, Seb Newman, <i>Committee Clerks</i> |
| † Mayhew, Jerome (<i>Broadland</i>) (Con) | |
| † Metcalfe, Stephen (<i>South Basildon and East Thurrock</i>) (Con) | † attended the Committee |

Public Bill Committee

Thursday 22 April 2021

(Afternoon)

[MR PHILIP HOLLOBONE *in the Chair*]

Advanced Research and Invention Agency Bill

2 pm

Schedule 3

CONSEQUENTIAL AMENDMENTS

Chi Onwurah (Newcastle upon Tyne Central) (Lab): I beg to move amendment 22, in schedule 3, page 14, line 3, at end insert—

“Freedom of Information Act 2000

(12) In Part VI of Schedule 1 to the Freedom of Information Act 2000 (“Other public bodies and offices: general”), at the appropriate place insert “The Advanced Research and Invention Agency”.”.

This amendment would make ARIA subject to the Freedom of Information Act 2000.

It is a great pleasure to serve under your chairship, Mr Hollobone. Amendment 22 is critical and very simple. It would make the Advanced Research and Invention Agency subject to the Freedom of Information Act 2000.

The amendment forms part of a sequence of amendments that we have tabled, which seek to deliver greater oversight of ARIA and greater accountability, in order to increase public confidence, particularly at this time when we are in the midst of a cronyism scandal. We do not believe that ARIA’s blanket exemption from the Freedom of Information Act regime can be justified.

I make the point that £800 million of public money will be spent by ARIA. It is a new agency whose aims and ambitions we all support, but public trust will be vital to its long-term success. In our evidence sessions, we heard from Government witnesses such as Professor Philip Bond. Dominic Cummings, the self-proclaimed architect of ARIA, gave similar evidence to the Science and Technology Committee, which celebrated trusting the leaders of ARIA with £800 million of taxpayers’ money and no purpose. The Labour party believe that this could be a side door to sleaze in science.

We do not want to bureaucratise ARIA. We acknowledge that a hands-off approach is integral to its success. We simply want ARIA to be accountable to the public via the Freedom of Information Act.

On Second Reading, the hon. Member for Newcastle-under-Lyme stated that,

“UK Research and Innovation receives about 300 FOI requests a year”.—[*Official Report*, 23 March 2021; Vol. 691, c. 830.]

I have since received an answer from the Science Minister to a parliamentary question, which states that, for example, UK Research and Innovation received 371 freedom of

information requests in 2020 and has answered 100 in the first three months of 2021. I asked about the costs to UKRI of complying with those requests, but it does not keep track of costs, which implies that they are not significant.

ARIA will be spending between 1% and 2% of the funding that UKRI is spending. If UKRI receives about 300 requests per year, we might calculate, say, that if freedom of information requests were related to the amount of public money being spent—a reasonable approximation—ARIA might receive between three and six freedom of information requests per year. I ask the Committee: would six freedom of information requests per year be a bureaucratic burden on ARIA, as the small and agile organisation we want it to be?

Aaron Bell (Newcastle-under-Lyme) (Con) *rose*—

Stephen Metcalfe (South Basildon and East Thurrock) (Con) *rose*—

Chi Onwurah: I give way to the hon. Member for Newcastle-under-Lyme.

Aaron Bell: I thank the hon. Lady for giving way and for welcoming me back to the Committee by mentioning me in her first paragraph. I was sorry to miss this morning’s sitting, but I was paired with an Opposition Member. I admire her mathematics, but given the interest in ARIA and the cutting-edge research that it will undertake, I do not think that scaling back in the manner she did and suggesting that it might receive only three to six requests a month is likely. As she knows, UKRI has a team of people to deal with freedom of information requests. We should consider carefully whether we want to put such a burden on ARIA, because we want it to be nimble and lean. I am afraid that I do not believe the quantum of money can be scaled to the number of FOI requests. I think ARIA would get an awful lot, given the research we want it to undertake.

Chi Onwurah: Will the intervention from the hon. Member for South Basildon and East Thurrock be on a similar point? I imagine it will.

Stephen Metcalfe: It was going to be on exactly the same point. I could not have put it better myself.

Chi Onwurah: My respect for the hon. Member only increases because he does not wish to repeat what somebody else has said. That is not always the case in this House, as we know. I welcome the intervention from the hon. Member for Newcastle-under-Lyme, and I would welcome a long discussion on probability, mathematics and statistics, but I can see that my Whip might not be entirely happy with that, so let me confine myself to this. I was not claiming that the estimate was rigorous. The hon. Member for Newcastle-under-Lyme suggested that because there will be more interest in ARIA, it will receive more Freedom of Information Act requests. That might be true for the first two or three years, but I do not think that level of interest would be maintained, even if it received more requests proportionately.

I mentioned funding because that is what enables activity, and freedom of information requests relate to that activity. Therefore, even if we doubled the greatest estimate to, say, 12, what price does the Committee think should not be paid for accountability and freedom of information? What would be too much? I was not here in Parliament for the expenses scandal, but we saw the impact that had on public confidence as we now see the cronyism scandals and their impact on public confidence and trusted institutions. Freedom of information and transparency is an essential part of that.

The Campaign for Freedom of Information reports that the Defense Advanced Research Projects Agency, with its significantly higher budget, was subject to just 48 requests in 2019. During the evidence sessions, we heard that UKRI was happy to deal with FOI requests, because it viewed them as an important aspect of spending public money. We also heard—this was telling—that the Royal Society of Edinburgh, although it is not subject to FOI, behaves as if it is and responds to requests because it views them as an important aspect of transparency. Regardless of whether the Minister accepts the amendment—I very much hope that she will—ARIA should echo the Royal Society of Edinburgh’s approach.

We heard in evidence from DARPA that it believed that rather than hindering the agency, the transparency offered by FOI requests was useful in building public trust in its work. In fact, DARPA’s deputy director stated that the level of oversight that it is subject to is “important to its success”. Other high-risk, high-reward agencies such as the Federal Agency for Disruptive Innovation in Germany, Vinnova in Sweden and the French National Centre for Scientific Research are all subject to the freedom of information requirements of their respective countries. What makes ARIA so different?

The protection of sensitive information cannot be used as justification for a blanket exemption, as the Freedom of Information Act 2000 already provides exemptions where disclosure would prejudice research or commercial interests, or cause a breach of confidentiality. In their initial response to the Secretary of State’s announcement of ARIA’s FOI exemption, NESTA said:

“Radical openness and honesty is needed or distrust will undermine it. The public will expect to know what’s happening with public money”—

I think we can very much see that now—

“and greater risk requires transparency and evaluation in order to determine what works.”

The Campaign for Freedom of Information said that ARIA

“will spend hundreds of millions of taxpayers’ money on high risk projects but the government apparently wants it to be less accountable to the public than parish councils, which are subject to FOI.”

In the evidence session, Tabitha Goldstaub said that “at Google’s moonshot factory, X...they started in secret and everything felt so appealing, to protect people from any feeling of failure, but what they learned is that there are so many other much better ways than secrecy to incentivise people and to give them the freedom to fail. Actually, allowing for more transparency builds much more trust and encourages more collaboration and, therefore, better breakthroughs.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 57, Q55.]

On what we are trying to achieve with this agency, the Minister has mentioned her concerns about bureaucracy a few times, but I think we as legislators have to decide

whether we believe that rules and regulations are simply mere bureaucracy to be thrown out whenever possible, or whether we believe that they can contribute both to the effectiveness of an agency and to the contract that we in Parliament have with the public to take their hard-earned taxpayers’ money and spend it as best we can to encourage and enable growth, prosperity, and a national health service—all things from which the public benefit. We cannot do that in secret; we have to do it publicly.

I really urge the Minister to accept the amendment. She knows that the exemption has come in for much criticism and that the controversy around it will continue to mar the progress of the agency. I urge her to listen to the siren voices of concern and to accept the amendment to remove ARIA’s exemption from the Freedom of Information Act.

Virginia Crosbie (Ynys Môn) (Con): It is a pleasure to serve under your chairmanship, Mr Hollobone. I would like to speak briefly to amendment 22. In the past week, we have discussed the concerns about exempting ARIA from FOI requests, and we have heard evidence about the potential burden of administration. UKRI told us that it has a team of staff purely to deal with the 300-plus FOI requests that it receives annually. In addition, Professor Dame Ottoline Leyser said that although UKRI is happy to be able to respond to FOI requests,

“there is a judgment call about the burden of administration”.—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 9, Q4.]

As my hon. Friend the Member for Newcastle-under-Lyme so eloquently put it—echoed by my hon. Friend the Member for South Basildon and East Thurrock—with unique freedoms and independence to enable transformational research, ARIA will inevitably receive a number of FOI requests that is disproportionate to its size.

Our vision for ARIA is that it should be lean and agile. Do we really want it encumbered by that level of administrative burden? Do we want ARIA’s brilliant programme managers to be stifled by bureaucratic paperwork?

We have also heard about whether ARIA will deliver the game-changing R&D that we want if it is subject to FOI. It was Tony Blair who gave us the Freedom of Information Act and it was he who subsequently described it as

“utterly undermining of sensible Government.”

To use his words:

“If you are trying to take a difficult decision and you’re weighing up the pros and cons, you have frank conversations...and if those conversations then are put out in a published form that afterwards are liable to be highlighted in particular ways, you are going to be very cautious.”

Professor Philip Bond put this view into an R&D context in his discussions with us last week. He said that “if you are asking people to go out on a limb to really push the envelope, I would assert that there is an argument, which has some validity, that you make it psychologically much easier for them if they do not feel that they are under a microscope.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee*, 14 April 2021; c. 29.]

Mr Blair and Professor Bond perfectly highlight the fundamental reason why ARIA should be free from

[Virginia Crosbie]

FOI. The last thing that our scientists need when they are looking for the next internet is to be held back by caution.

2.15 pm

The Bill already contains very strong statutory commitments to its transparency. There will be an annual report laid before Parliament. Its accounts and spending will be published. There will be non-legislative mechanisms set out in a framework document. There will be a thorough and transparent selection process to ensure that it is led by respected individuals who uphold public honour. There will also be access to FOI requests on ARIA via the Department for Business, Energy and Industrial Strategy.

For all these reasons, I believe that there is no need for ARIA to be subject to an FOI regime that will stifle creativity and create unnecessary bureaucracy.

Kirsty Blackman (Aberdeen North) (SNP): I want to make a couple of comments. We have talked a lot about transparency and the need for it, but mostly in the context of the scrutiny that we as parliamentarians will levy on ARIA. It is really important that we have transparency so that the public and journalists can scrutinise it. We are not always fans of some of the journalism that happens, but I hope we are all agreed that journalism plays a hugely important role and that journalists have no other route to access the information that they should have on ARIA in order to bring things to the public's attention.

We discussed also the tolerance for failure that exists in the UK, and how it might differ from tolerance for failure in the US. I suggest that having more public transparency about that and more openness about the processes in ARIA would ensure that the public are more on board with the organisation's ability to fail. The organisation should have the ability to fail, but if we do not know that that is happening, because we have not been able to scrutinise it, and that suddenly comes out in the end-of-year annual report, it will be even more of a shock for the public than if they had heard about it along the way.

On the topic of scrutinising the Department for Business, Energy and Industrial Strategy, it is interesting to consider whether BEIS will provide us with responses if we send it written questions on the subject of ARIA. That would be helpful to know. If there is not a normal mechanism for us or journalists to scrutinise this through FOI, it would be helpful to have some comfort that written questions relating to ARIA will be answered, with as much detail as the Minister feels can be given at that time.

Daniel Zeichner (Cambridge) (Lab): It is a pleasure, Mr Hollobone, to serve with you in the Chair for the second time this week.

This has been a really interesting discussion, because it has demonstrated two very different views of how the world might operate. I am sorry to hear the Government's view on this. When they are in Opposition, they might find that they are quite keen on freedom of information. All Governments, of course, are keen not to be subject

to scrutiny in this way. There is a fundamental point about the modern world now, even more than 10 or 20 years ago. Perhaps it is because of the kind of constituency I represent, but I have a lot of people who are interested in what is going on and they expect, as citizens and taxpayers, to be able to ask questions, particularly where public money is being spent.

Let me give two very quick examples. Artificial intelligence is the kind of issue that may well be dealt with by ARIA. It is hugely controversial. Just a couple of years ago, many of my constituents, on the way home from King's Cross, found that they had been subject to facial recognition technology. How did they find out about that? Ultimately, it was through freedom of information. It is always the case that the people who have the knowledge, the power and the control do not want to share it with others. That is not a good way of maintaining public trust. Just this morning, I found myself at the Dispatch Box challenging a Minister because expert advice on bee-killing pesticides had been revealed not through parliamentary questions or asking or writing letters, but through Friends of the Earth's freedom of information requests. I understand why the Government do not want that information out there, but it should be out there, and ARIA should be in the same place. We should have confidence in the work being done, however close to the edge it is. Ultimately, it is about maintaining public trust. We are entering a hugely complicated world, in terms of science and technology. We will not keep the public with us by hiding and not acceding to freedom of information requests.

The Parliamentary Under-Secretary of State for Business, Energy and Industrial Strategy (Amanda Solloway): The Government are committed to good governance and transparency, and I believe that the Bill in its current form embeds that within ARIA. With regard to amendment 22, we have carefully considered the case for and against subjecting ARIA to the Freedom of Information Act. The intention is for ARIA to have a streamlined operating structure, with decision makers who can solely focus on ARIA's research goals. We have spoken and heard a lot about culture and how important that is to facilitating an environment that pursues transformational research.

In turn, we have thought carefully about guaranteeing accountability and transparency in the most appropriate way. There are many different mechanisms to achieve this, and I cannot accept the claims that no such oversight exists for ARIA. To reiterate: the Bill requires ARIA to submit an annual report and statement of accounts, which will be laid before Parliament; ARIA will be audited by the National Audit Office and subject to value-for-money assessments; ARIA will interact with Select Committees in the usual way; and we will draw up a framework document detailing ARIA's relationship with BEIS and further reporting requirements, such as details of what will be published in the annual report. Together, these provisions are rigorous and proportionate and will ensure that the research community, MPs, peers and taxpayers are informed of ARIA's activities and where it spends its money.

By not subjecting ARIA to the Freedom of Information Act, ARIA's leadership and scientists will be free to find and fund the most cutting-edge research in the UK and the world, and to maintain the UK's competitive advantage

as a science superpower. While there are exemptions to freedom of information requests, they must still be processed, and that administration is likely to run contrary to the lean and agile operation of ARIA. To be clear, other bodies subject to the Freedom of Information Act, such as universities and Government Departments, including BEIS, will still process requests regarding their activities with ARIA in the usual way. I hope that makes it clear that this is not about reducing transparency; it is about making ARIA streamlined. I hope that the hon. Member for Newcastle upon Tyne Central understands why I cannot accept the amendment.

Chi Onwurah: I thank those Members who have taken part in the debate, which highlights, as my hon. Friend the Member for Cambridge said, a real difference between us and Government Members. I totally understand why Government Members do not want Government conversations to be known at the moment—releases of those on WhatsApp have not been in their interest. However, we strongly believe that freedom of information is a duty of public bodies, so I will press the amendment to a Division.

The Committee divided: Ayes 5, Noes 9.

Division No. 16]

AYES

Blackman, Kirsty	Onwurah, Chi
Flynn, Stephen	
Furniss, Gill	Zeichner, Daniel

NOES

Baker, Duncan	Metcalfe, Stephen
Bell, Aaron	Richardson, Angela
Crosbie, Virginia	Solloway, Amanda
Fletcher, Mark	Tomlinson, Michael
Mayhew, Jerome	

Question accordingly negated.

Question proposed, That the schedule be the Third schedule to the Bill.

Amanda Solloway: Schedule 3 contains consequential amendments. There are a number of significant points to highlight, and a number of standard consequential amendments and obligations, which I will turn to first. The schedule has the effect of ensuring that records produced by ARIA should be treated as public records; subjecting ARIA to investigation by the Parliamentary Commissioner for Administration, the body responsible for investigating the administrative actions of public authorities; and disqualifying members of ARIA from membership of the House of Commons and the Northern Ireland Assembly. Those are all standard provisions.

Schedule 3 includes amendments to the relevant devolution Acts, with the effect of reserving ARIA. That will bring it into line with the other major public R&D funding institutions under the UKRI umbrella, including the most recently created Innovate UK. That will guarantee that, across the United Kingdom, ARIA can operate with minimal bureaucracy and without the possibility of unequal obligations or requirements on its activities in different nations. It is important to be clear that the devolved Administrations will continue to be able to fund research to the same extent that they can

do now. The specific reservation of ARIA does not prevent the Welsh Government or the Scottish Government from providing additional support for advanced research in future.

The other significant provision in schedule 3 is the exemption of ARIA from the obligations on a contracting authority, for the purpose of the Public Contracts Regulations 2015. We have discussed that and I will not return to it. The provisions here are important for the effective operation of ARIA, and I commend them to the Committee.

Question put and agreed to.

Schedule 3 accordingly agreed to.

Clause 10

POWER TO MAKE CONSEQUENTIAL PROVISION

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 10 contains a power for the Secretary of State to make consequential provision. There are three points I would like to make on this clause. First, the power is only exercisable in consequence of the provisions of what will be the ARIA Act, or regulations made under clause 8, which we have already discussed. That represents a significant narrowing of the scope of the power. Secondly, I emphasise that it is a standard provision that allows issues that might emerge in future to be straightforwardly addressed. There is a comparable power in the Higher Education and Research Act 2017. Thirdly, as set out in clause 11, which we will turn to next, any regulations made under that power that amend, repeal or revoke any provision of primary legislation or retained direct principal EU legislation will be subject to the draft affirmative resolution procedure. That means that Parliament will have a say on any use of that power.

Finally, I would like to illustrate why the power is needed. If ARIA were to be dissolved in future through regulations made under clause 8, the references to ARIA inserted in other legislation would remain, and clause 1 of the Act—stating that ARIA was established—would be left hanging. In that situation, the power could be used to repeal the relevant clauses of the ARIA Act and remove references to ARIA elsewhere, which would be necessary and important to tidy the statute book and avoid confusion and ambiguity. I hope that demonstrates the importance of the power being taken.

Question put and agreed to.

Clause 10 accordingly ordered to stand part of the Bill.

Clause 11

REGULATIONS

Question proposed, That the clause stand part of the Bill.

2.30 pm

Amanda Solloway: Clause 11 concerns the regulation-making powers in the Bill, which are limited. The principal point of interest is the parliamentary procedure that each of these delegated powers will be subject to.

[Amanda Solloway]

Subsection (4) sets out that regulations made under clause 8 to dissolve ARIA and any regulations under clause 10 that amend, repeal or revoke any provision of primary legislation or retained direct principal EU legislation will be subject to the draft affirmative resolution procedure. These are the most substantial powers, so I consider that it is right that Parliament has a say over how they are exercised.

With the exception of regulations made under clause 14 concerning commencement, any other regulations made under the ARIA Bill will be subject to the negative resolution procedure. These are predominantly concerned with operational and procedural details, so again I consider that the negative resolution procedure is appropriate in this case, and I hope the Committee agrees.

Question put and agreed to.

Clause 11 accordingly ordered to stand part of the Bill.

Clause 12

INTERPRETATION

Chi Onwurah: I beg to move amendment 23, in clause 12, page 5, line 10, after “social sciences” insert “and the humanities”.

This amendment would modify the definitions of scientific knowledge and scientific research to encompass the humanities.

The Chair: With this it will be convenient to discuss amendment 24, in clause 12, page 5, line 13, after “social sciences” insert “and the humanities”.

See the explanatory statement for Amendment 23.

Chi Onwurah: We are moving through this Bill at speed, so it would be good to take a few moments to think about the role of the humanities. These amendments modify the definition of scientific knowledge and scientific research to encompass the humanities.

It is incumbent on us, particularly during a pandemic when we are missing so many of the arts and other aspects of culture, to recognise the very important role that the humanities play, not only in our mental and social wellbeing but in scientific research, and particularly in our understanding of the world around us. We believe that science can be the engine of progress for our society, and it needs to be for and by everyone. Expanding the scope of ARIA’s research to include the humanities can provide greater returns for society.

This also speaks to the Government’s so-called levelling-up agenda. As part of that, they must appreciate the important role that social sciences and the humanities play in helping us understand and solve many of the issues faced in all our communities across our United Kingdom. ARIA presents us with an opportunity to drive innovation across the country, but it must be done in the right way. Currently, the Bill fails to adequately factor in the importance of all forms of research.

The statement of policy intent makes no reference to the social sciences. The examples of areas that may be funded by ARIA are AI, quantum computing and

robotics. They are very important, but we also need answers from the Government on how they envisage that ARIA’s social science funding will work.

The recent report into race and ethnic disparities, commissioned by the Prime Minister, has been roundly condemned—indeed, trounced—for its lack of coherent or credible research. It has been criticised by historians, social scientists and academics from across our country. That illustrates very well how important it is that we have strengths in humanities and social science research, and that the Government and the Prime Minister recognise that. The role that institutional racism and prejudice play in the lives of so many in this country is worthy of credible research. Addressing the many inequalities that so many people still face is surely a worthy challenge—a worthy moonshot—that ARIA should consider.

Mariana Mazzucato, a leading academic and economist of mission-oriented research, said that all science should address social inequality. We heard from Felicity Burch that:

“Clearly defining the mission of what ARIA is trying to achieve when we get the team in place, making sure that it is something that excites people, having a clear market, and also solving national and international social problems will help encourage really bright, brilliant people to get involved.”—[*Official Report, Advanced Research and Invention Agency Public Bill Committee, 14 April 2021; c. 68, Q66.*]

With our two amendments, we wish to ensure that the humanities are considered part of ARIA’s remit.

Amanda Solloway: I will speak to amendments 23 and 24 together. ARIA is unashamedly focused on achieving transformational breakthroughs in the sciences, and this is reflected in the definition set out in clause 12. I say to the hon. Member that scientific research and scientific knowledge are broadly defined to include the social sciences. I do not believe it is helpful for ARIA to extend the interpretation of “sciences” to include humanities. There are other funders that do a fantastic job at supporting the humanities, including the Arts and Humanities Research Council, but that is not the Government’s intention for ARIA. I hope the hon. Member will withdraw the amendments.

Chi Onwurah: I am disappointed in the Minister’s response, but I will not push the amendments to a vote. I beg to ask leave to withdraw the amendment.

Amendment, by leave, withdrawn.

Daniel Zeichner: I beg to move amendment 25, in clause 12, page 5, line 13, at end insert—

““Invention” means the process by which ideas are converted into value in the form of new and improved products, services and approaches.”

This amendment would establish the meaning of “invention” as referred to in the title and functions of ARIA.

The amendment is about defining “invention.” Before the sharp-eyed hon. Member for North Norfolk points out that, at the start of these proceedings, I tried to take the word “invention” out of the title, I repeat my earlier observation that we are quite prescient on this side of the House. I had rather anticipated that, despite all the fantastic strength of our arguments, Government Members were not necessarily persuaded, strangely enough.

Aaron Bell: I thank the hon. Gentleman for making that point, which I considered making as well. Given his remarks on Tuesday and his obvious love for the operative nature of the Bill, it seems he might have considered changing the name of ARIA to the Advanced Research and Insulation Agency.

Daniel Zeichner: I would certainly like to do that, because we have a Government who have been unable to insulate our homes for a decade, but never mind. There are many musical references that could be made, including to The Mothers of Invention, with whom I grew up, but I suspect their notion of invention is rather different from the Government's.

There is a serious point here, and it is a theme to which I return. We really think there is a problem with not having a clear definition. It seems to us that there are two very different approaches. The Government's view is basically that our structure of accountability, and the way we deal with public money, is a problem for innovation. It is a difficulty that should be got rid of. I am afraid it goes back to the Dominic Cummings question, because that is his view of the world too. We take a very different view. Far from thinking that it is a problem, we think it is actually part of creating an innovation landscape—a community of people who are working towards shared goals.

Jerome Mayhew (Broadland) (Con): I, too, was very tempted to make an intervention about the change in name, but I scanned through the entire Bill and noticed that there was one other mention of the word “invention” in the body of the text, so we were not able to move on that. But words have natural and ordinary meanings. The hon. Gentleman would perhaps refer to the “Cambridge Dictionary”, which defines “invention” as “a product or a way of doing something which has never been made or never existed before”.

What is wrong with relying on the “Cambridge Dictionary” definition?

Daniel Zeichner: Absolutely right, and I have no objection to ever relying on anything that has been developed in Cambridge through a collegiate, collaborative approach of people working together. I was just about to say that we would be very happy to negotiate a definition of “invention”—I am very happy to take that one. We are just trying to help the Government to provide some clarity in the Bill. I suspect the Minister will not be tempted to take up the offer.

I will conclude by mentioning the public money point, which my hon. Friend the Member for Newcastle upon Tyne Central referenced. I can barely believe that I am saying this to Conservative Members, because I have been lectured many times over the years in various places about how it is taxpayers' money and every penny needs to be spent carefully. It is absolutely right and proper that that should be done—£800 million is at least £10 per person. I suspect that other Members are knocking on doors at the moment and having a conversation with people, asking them how they are going to vote. I just wonder how many Members over the next week or two would like to end the conversation by saying, “Can I have a tenner, please?” When people ask, “What for?”, they offer the back of an envelope

and say, “I don't really know—I've no idea—but it might produce something wonderful.” And then they look down the list and find six others in the household, so they up it to £60. I do not think so. I think the public are not going to be convinced about this. Maybe—just maybe—a wonderful innovation will come through this, but I fear that, in years ahead, we will find that we are back discussing this again and will be putting in some of the checks and balances that are actually required.

Amanda Solloway: I thank the hon. Member for the suggestion and I understand the sentiment. It is incredibly important that ARIA's transformational ideas can lead to value creation. However, it is not necessary to use legislation to define words that already have a common meaning, as I believe “invention” does. I also emphasise that other definitions in clause 12 of the Bill—of “scientific knowledge” and “scientific research”—mirror existing provision in the Science and Technology Act 1965, so there is a precedent for the approach in that specific case. “Invention”, in contrast, is a commonly used concept that appears through the Patents Act 1977, and the term “invention” is not subject to a specific definition in that Act. I strongly suggest that we rely on the commonly understood meaning of “invention”, which is “the process of creating something that has never been made before”, and that that definition is sufficient, and I encourage him to withdraw the amendment.

Daniel Zeichner: I do not need to detain the Committee further. I beg to ask leave to withdraw the amendment.

Amendment, by leave, withdrawn.

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 12 contains further information on the interpretation of terms used in the Bill. It is a straightforward, technical matter and I hope that it is helpful in illuminating some of the clauses previously discussed.

Question put and agreed to.

Clause 12 accordingly ordered to stand part of the Bill.

Clause 13

EXTENT

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 13 details the extent of the Bill, which is UK-wide. Research is a collaborative endeavour, and working right across the United Kingdom, as other public research funders do, will be essential for ARIA in forging a wide range of productive partnerships. I hope hon. Members agree that this arrangement is beneficial for research organisations everywhere.

Question put and agreed to.

Clause 13 accordingly ordered to stand part of the Bill.

Clause 14

COMMENCEMENT

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: Clause 14 contains standard provision for the commencement of the ARIA Act following Royal Assent. It contains a power for the Secretary of State to make commencement regulations. There is a limited number of provisions that for practical reasons will immediately come into force. That includes the power to make consequential provision in clause 10 so that it could, if needed, be used immediately after Royal Assent to address any issues that emerged. I am sure that the Committee will agree that the clause is standard.

Question put and agreed to.

Clause 14 accordingly ordered to stand part of the Bill.

2.45 pm

Clause 15

SHORT TITLE

Question proposed, That the clause stand part of the Bill.

Amanda Solloway: This clause provides the short title of the Bill. ARIA's name has already been discussed at the very start of proceedings, and I do not think we need revisit that discussion here.

Question put and agreed to.

Clause 15 accordingly ordered to stand part of the Bill.

New Clause 1

PROTECTION OF INDEPENDENCE OF ARIA

"In exercising functions in respect of ARIA, the Secretary of State must have regard to the need to protect its independence."—(*Chi Onwurah.*)

This new clause would require the Secretary of State to have regard for the need to protect ARIA's independence when exercising functions under the Bill, including with respect to appointments.

Brought up, and read the First time.

Chi Onwurah: I beg to move, That the clause be read a Second time.

The entire debate has been extremely exciting, and I know we are all reluctant to bring it to a close, but the new clause, which I will discuss briefly, is in keeping with all our constructive amendments that we have considered in our debate on ARIA. The new clause would improve the Bill and protect the spirit and goals of ARIA. Indeed, it would clarify them in places.

The new clause would ensure that when exercising functions in respect of ARIA, the Secretary of State must have regard to the protection of its independence. Members on the Government and Opposition Benches have talked about the importance of ARIA's independence and referred to the challenges to the relationship between business and Government that we see now in the many conflicts of interest and concerns that have been raised about sleaze and cronyism that are now being considered in Parliament and in Committees.

We feel it is important to set out that ARIA is independent and can act with operational independence. Indeed, the Minister has repeatedly told the Committee that she wants ARIA to act with operational independence. "Extreme freedom" was Dominic Cummings' clarion call in his evidence to the Science and Technology Committee.

The new clause would ensure that the Secretary of State had regard to ARIA's independence when exercising all functions under the Bill, such as his power of appointment. For example, appointing a major Conservative party donor or a Conservative peer to the board of ARIA would clearly have a damaging effect on ARIA's independence and how that independence was perceived by the scientific community.

I hesitate to predict what the Minister will say, but I suspect that she will not look favourably on this amendment and she may say that the ministerial code already requires Ministers to behave in a way that upholds the highest standards of propriety and ensures that no conflicts of interest arise. In response to that, I would say that we can clearly see the repeated undermining of the code by Ministers in this Government and—critically—the current vacancy for the Prime Minister's independent adviser on Ministers' interests.

I also remind the Committee that the Government themselves introduced a very similar amendment to the Environment Bill—new clause 17—that imposes the same obligation on the Government in exercising functions under that Bill in relation to the Office for Environmental Protection. If such a measure is appropriate for the Environment Bill, why not for this Bill? For as long as we have this cloud of sleaze allegations hanging over this Government, we must ensure that we are crystal clear when it comes to key issues such as independence, propriety, conflicts of interest, and so on.

In addition, I will just briefly quote some witnesses who gave evidence. Tabitha Goldstaub, for example, said that

"ARIA has to be independent".—[*Official Report, Advanced Research and Invention Agency Public Bill Committee, 14 April 2021; c. 56, Q54.*]

Dr Dugan said:

"That independence of decision making and the crafting of those programmes in that spirit are coupled, and that is part of the reason why the agency"—

that is, the Defence Advanced Research Projects Agency in the US—

"has been so successful over years."—[*Official Report, Advanced Research and Invention Agency Public Bill Committee, 14 April 2021; c. 47, Q43.*]

And I will close by quoting Professor Glover, who said:

"I would argue that there is huge value in that"—

"that" being the independence of ARIA, and that:

"Obviously, the funding is coming from Government, but by giving it freedom from Government you might also be giving it the freedom to fail in many ways, and that is exceptionally important. If it is seen as very close to Government—whichever Government is in power—it potentially becomes a bit like a political football, either in what is being funded or in the direction suggested for where ARIA funding should go."—[*Official Report, Advanced Research and Invention Agency Public Bill Committee, 14 April 2021; c. 55, Q54.*]

I think that all Members of the Committee will agree that we do not wish ARIA to become a political football; we certainly want it to avoid the controversy that has affected football itself in the last few days. We want its independence to be crystal clear. We do not want it to be subject to, or tainted by, any of the allegations of sleaze or cronyism, or the corrupting influence of there being too close a relationship between business and Government. By accepting this amendment, the Committee will send a clear message in that regard.

Amanda Solloway: New clause 1 concerns ARIA's independence, which is at the core of our policy aims here, and the Bill has been drafted to set ARIA as free from ministerial interference as possible. ARIA will set its own research programmes, recruit freely at the executive and programme manager level, and make decisions on what programmes to start and finish without recourse to Ministers.

I observe a contradiction in moving this new clause to protect ARIA's independence to be discussed alongside a series of amendments which would take powers away from ARIA and give them to the Secretary of State. The Secretary of State deliberately has limited powers and the Bill strikes the right balance between providing ARIA with the independence to operate freely, which we believe is critical to its success, and sufficient Government oversight to protect the use of public funds, for example, the right to remove non-executive members or to intervene where necessary or expedient on national security grounds, or the Secretary of State's reserve power to introduce procedure in law affecting conflicts of interest, a power that is not found in the Bill but which creates other statutory corporations, such as UKRI. These measures represent appropriate protections, rather than controls, affording ARIA greater freedoms and independence than those of typical arm's length bodies.

Without real freedoms, there is a danger that ARIA will get pulled closer by Ministers over time, and will become an arm's length body like any other. I therefore do not think the new clause is needed.

Chi Onwurah: There is not a contradiction between wanting to establish ARIA's independence while also ensuring the same levels of scrutiny. For us they are two sides of the same coin. As this is our last proposed amendment, I want to press the new clause to a Division.

Question put and negatived.

New Clause 2

CARBON COSTS

"ARIA must—

- (a) have regard to the carbon costs of decisions it makes; and
- (b) operate with net zero carbon costs."—(*Stephen Flynn.*)

This new clause is intended to ensure that ARIA has regard to the carbon costs of its decisions, and runs with net zero carbon costs.

Brought up, and read the First time.

The Chair: We now go to Aberdeen South to move new clause 2.

Stephen Flynn (Aberdeen South) (SNP): I beg to move, That the clause be read a Second time.

We are indeed going to the better side of Aberdeen, although I should be very careful on my way home, because my hon. Friend the Member for Aberdeen North and I are both on the same flight later.

I do not want to go over the arguments that we had earlier in the week. I think we had quite enough on net zero and climate change. We do of course still hold the view that that should be the abiding mission of ARIA itself. Given that the Bill does not make any provision

for what we are suggesting in the new clause, it should be brought forward at this moment in time. I hope the Minister will be able to allay my concerns with her remarks.

Amanda Solloway: We discussed climate change extensively on Tuesday. I want to put it on the record that I agree with the hon. Members who raised the urgency and importance of tackling that issue. As I am sure the hon. Member for Aberdeen South is aware, however, the clause would be a very unusual provision for a statutory corporation. I also want to emphasise that ambitious legislative action has already been taken by the Government in this regard, with our strong statutory commitment to net zero making the UK the first major economy in the world to do that.

As I have said before, achieving the legislative commitment to net zero remains one of the Government's top priorities, as demonstrated by the Prime Minister's 10-point plan. I know that ambition is shared by colleagues across this place. I therefore recognise why the clause has been brought forward today. I would, however, caution against placing an immediate obligation on ARIA that is out of step with the wider 2050 timescale for reaching net zero.

ARIA is also likely to be a very small organisation with a small footprint. I also want to emphasise that ARIA will be subject to the Environmental Information Regulations, which require public authorities such as ARIA to make environmental information available. This would likely include data relating to carbon costs. We have discussed the importance of giving ARIA freedom and independence and space to establish itself, and ultimately I do not think that imposing that immediate statutory obligation is the right way to achieve the climate objectives that it speaks to, or to ensure the success of ARIA.

Stephen Flynn: I beg to ask leave to withdraw the new clause.

Clause, by leave, withdrawn.

3 pm

New Clause 3

PRESENTATION OF FUNDING IN ESTIMATES

'(none) ARIA's funding must be presented as a discrete item in the Supply Estimate presented to Parliament by HM Government. —(*Kirsty Blackman.*)

This new clause is intended to ensure that in the Estimates process, spending on ARIA is transparent and able to be scrutinised.

Brought up, and read the First time.

The Chair: The new clause is in the name of the SNP, and we go this time to Aberdeen North.

Kirsty Blackman: I beg to move, That the clause be read a Second time.

Aberdeen North is by far the best part of Aberdeen, Mr Hollobone.

I know that new clause 3 is the most exciting thing, and that the Committee has been waiting for it the whole time. It is the key moment in our discussions. I jest—but it is important. The past few years saw the

[Kirsty Blackman]

advent of English votes for English laws in Parliament, and we were told during its development that even though Scottish MPs were being written out of having a say on England-only legislation, we would still have a say on Barnett consequentials, because we would be able to vote during the estimates process.

We have made our issues with that process clear. Despite good changes to the system and the way we scrutinise estimates, the process is still wholly inadequate. Part of that inadequacy is the fact that we have no certainty about what will or will not be a discrete line within the estimates. We have no certainty about whether we can get the costs for something. As the shadow Minister said, when she asked for costs for UKRI, in relation to freedom of information requests, for example, she did not get them. Even if ARIA is to be an arm's length organisation in relation to BEIS, with a memorandum of understanding, but it will be spending public money, I would be keen to keep track of how much we are allocating to ARIA each year. Once again, it would be quite good if the Minister would make a commitment to a discrete line in the estimates. If she does that, I will be more than happy to say nothing else.

Amanda Solloway: New clause 3 is intended to ensure that ARIA is presented as a discrete item in the supply estimates. ARIA will be funded by BEIS and, like all other BEIS arm's length bodies, will be separately identified in the BEIS supply estimates. ARIA statements of accounts, which will be laid before Parliament every year, will also include information on ARIA's funding from BEIS. I therefore believe that the new clause would be an unnecessary addition to the Bill.

Kirsty Blackman: With that confirmation from the Minister, I am happy to say that I beg to ask leave to withdraw the motion.

Clause, by leave, withdrawn.

New Clause 4

ETHICAL CODE FOR INVESTMENT

'(1) Within three months of the date of commencement of this Act, the Secretary of State must lay before Parliament a code for ethical investment developed and agreed by ARIA.

(2) The code of ethics developed by ARIA under subsection (1) must go beyond regulatory requirements and adopt a best practice approach.'—(Stephen Flynn.)

This new clause is intended to ensure that ARIA develops a code for ethical investment that goes beyond regulatory requirements and adopts a best practice approach.

Brought up, and read the First time.

Stephen Flynn: I beg to move, That the clause be read a Second time.

Again, the new clause is very straightforward. It is intended to ensure that ARIA develops a code of ethical investment that goes beyond regulatory requirements, and adopts a best practice approach. What is not to like? That is something that we should all aspire to, particularly when it comes to such a significant amount of public money. We have talked at length today and on Second Reading about ARIA's ability to dodge freedom

of information requests, and the like. The new clause would provide the assurance that we need, given that the Government appear unwilling and unable to take forward our views on freedom of information. It perhaps provides a compromise position.

Amanda Solloway: I recognise the issue raised in the amendment. The most transformational scientific research, of the kind that will be pursued by ARIA, is likely to have a wide range of potential technological applications, across different areas. Such research may prompt new ethical debates, such as those that we are already having about AI and robotics. The Government welcome lively, open and democratic public and parliamentary debate on the roles that new technologies play in our lives, and I do not think that that is something we should shy away from. However, I assure the hon. Gentleman that ARIA will operate in line with the law that already governs issues of research ethics, such as the use of animals in research. ARIA will not be given special dispensation to fund research that is not considered appropriate elsewhere.

I draw attention to the fact that there is no specific legislative requirement placed on UKRI, a much larger-scale funder, with respect to issues of research ethics. For ARIA the Government would be able to intervene in exceptional circumstances through the national security provision in clause 4 of the Bill, as we have already discussed.

Kirsty Blackman: I understand what the Minister says about the fact that there is no such provision for UKRI. However, perhaps if was being set up now, we would suggest that there should be. For her information, the Scottish National Investment Bank has a clause almost identical to new clause 4, on ethical investment. We believe that if the Scottish National Investment Bank can operate on that basis, ARIA should have no problem doing so. I understand exactly what she says about the debates that are happening, but that is why it is even more important for ARIA to sign up to some kind of code of ethics that we can all scrutinise.

Amanda Solloway: To reiterate our viewpoint, the Government would be able to intervene in exceptional circumstances through the national security provision in clause 4, which we have already discussed, and by introducing powers on the grounds of conflict of interest and appointing a new chair or new non-executive directors. More broadly, in working with relevant Government institutions, special attention will be paid to ensuring that ethical questions generated by research are thoroughly explored and that we strike an appropriate balance between innovation and caution.

Stephen Flynn: I beg to ask leave to withdraw the motion.

Clause, by leave, withdrawn.

New Clause 5

HUMAN RIGHTS ABUSES

"No ARIA resources may be used in any way that would contravene human rights."—(Stephen Flynn.)

This new clause is intended to ensure that ARIA is not able to contravene human rights.

Brought up, and read the First time.

Stephen Flynn: I beg to move, That the clause be read a Second time.

It is perhaps apt to reflect on the debate on the annunciator screens, which relates to many right hon. and hon. Members' concerns about human rights. Those concerns are just and appropriate, and I do not think that any of us wants to be under any illusion about whether ARIA might have cause to have or seek investment in technologies that may contravene human rights. It is an incredibly serious topic.

We can see from the Bill the flexibility and freedom that ARIA will have. We hear from the Government that they want it to be agile and nimble, and we know that it will not have the level of scrutiny and transparency that perhaps it should—certainly in our view. I would welcome an incredibly serious tone from the Minister and a cast-iron assurance that human rights will not be contravened in any way, shape or form by ARIA and its processes.

Chi Onwurah: I second the concerns raised by the SNP spokesperson. If ARIA commissioned research, for example, that was collaborative between the UK and a Chinese tech company involved in the Uyghur human rights abuses, which are so extreme, how would we know about it and what action could be taken?

Amanda Solloway: I completely agree with the sentiment and the intention behind the new clause. Human rights are protected in law in the United Kingdom through the Human Rights Act 1998, and ARIA will be subject to public authority obligations under the Act. I refer the hon. Member for Aberdeen South to the first page of the Bill, which confirms that the Secretary of State has signed a statement to the effect that

“the provisions...are compatible with the Convention rights.”

I therefore reassure the Committee that ARIA will operate in a way that is compatible with the European convention on human rights; indeed, it would be unlawful under existing legislation for it not to do so. I hope that that satisfies the hon. Member that there is no need for the new clause.

The Chair: Mr Flynn, the ball is in your court.

Stephen Flynn: I think that there remain some outstanding concerns that are not covered by other Acts from the UK Government that we have debated in the House over many years. I do not think that the Minister necessarily addressed the shadow Minister's question about ARIA seeking to partner with an organisation that was in breach of human rights or that contravened them in its activity, but I am more than happy for her to intervene if she wishes to correct me.

Chi Onwurah: The concern over human rights in supply chains for tech companies has been raised a number of times, but we have yet to see it properly addressed by the Government. That echoes a concern represented here, and I hope that there will be an opportunity for the Minister to reassure us further.

Stephen Flynn: I thank the hon. Member for that important contribution. On that note, I will press the new clause to a vote. I hope the Government will reflect on the issue before the Bill comes back to the House.

Question put and negatived.

Question proposed, That the Chair do report the Bill to the House.

The Chair: I know that Members will be disappointed that this is the final question before the Committee.

Chi Onwurah: On a point of order, Mr Hollobone. I thank you for the way in which you have chaired our deliberations, and for your guidance and that of the Chair of each sitting. I thank the Committee members, whose contributions have just about always been good-natured and constructive, and have often been humorous and enlightening at the same time. I offer my particular thanks to the Clerks of the Committee, to *Hansard* for taking down our words of wisdom—or whatever—so accurately and concisely, and to all the staff and Officers of the House who have furnished us with excellent briefings for the evidence sessions. We have benefited from their advice and guidance outside of the Committee Room as well.

Kirsty Blackman: Further to that point of order, Mr Hollobone. I echo the comments made by the shadow Minister. I have said thanks very much to the Clerks, but I also put on the record my thanks to Dr Jonathan Kiehlmann and Scott Taylor, our staff members who have been assisting us. I also put on the record my thanks to the Minister, who wrote to us with a response to questions that we asked on Tuesday. I thank her and her team for ensuring that happened.

Amanda Solloway: Further to that point of order, Mr Hollobone. I take this opportunity to place on the record my sincere thanks to the Chairs for their excellent chairship. We have finished proceedings early, and I thank the Whips on both sides for their efforts in the management of time. I thank the excellent witnesses we heard from last week, and I thank all members of the Committee for our constructive debates. I am so pleased that every member recognises ARIA's potential to bolster the reach of R&D funding across the whole United Kingdom and to be at the global forefront of new discoveries.

I very much welcome the sentiment behind the amendments we have discussed, such as maintaining the independence of ARIA, diversity in science and the importance of combating climate change. I hope I have demonstrated that the Bill will create a leading independent research institution and, while it is not for this piece of legislation, that the Government are making significant progress on other areas of policy through our net zero commitments and our upcoming people and culture strategy and places strategy. I welcome the support in delivering those aims.

Finally, I offer my thanks to the Clerks, the Doorkeepers, *Hansard*, all the parliamentary staff who have supported the debate and all members of the Committee for ensuring smooth proceedings and the livestreaming of the discussions. I look forward with great anticipation to the next stages of proceedings on the Bill and the continued insight from my experienced colleagues across the House.

The Chair: I thank the Clerks for their hard work, and the *Hansard* reporters and all hon. Members for their attendance this afternoon.

Question put and agreed to.

Bill accordingly to be reported, without amendment.

3.15 pm

Committee rose.

