

# Science and Technology Committee

## Oral evidence: A new UK research funding agency

Wednesday 17 March 2021

Ordered by the House of Commons to be published on 17 March 2021.

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Members present: Greg Clark (Chair); Aaron Bell; Dawn Butler; Chris Clarkson; Katherine Fletcher; Mark Logan; Rebecca Long Bailey; Carol Monaghan; Graham Stringer.

Questions 168 - 288

### Witnesses

**I:** Dominic Cummings, Former Chief Adviser to the Prime Minister.

**II:** Rt Hon Kwasi Kwarteng MP, Secretary of State for Business, Energy and Industrial Strategy; and Jo Shanmugalingam, Director General for Industrial Strategy, Science and Innovation, Department for Business, Energy and Industrial Strategy.

## Examination of witness

Witness: Dominic Cummings.

Q168 **Chair:** The Government have said that they would prioritise investment in world-leading science research, including the biggest ever increase in the science budget, £22 billion a year, and to create a new science funding agency modelled on the US Advanced Project Research Agency, or ARPA. The Science and Technology Committee undertook an inquiry into this new funding agency, and we issued a report on 12 February. The Bill to bring into existence what will be known as ARIA—the Advanced Research & Invention Agency—backed by £800 million of taxpayers' money, was published two weeks ago, and is about to begin its scrutiny in both Houses of Parliament.

The Prime Minister's previous chief adviser, Dominic Cummings, through his writings, is widely thought to be the originator of the ARPA model proposal for the UK, and, indeed, is known to be a supporter of the commitment to increase the science budget. Now that he is no longer working for the Government, he is free to speak, and we are very grateful for his attendance today. We are also delighted to anticipate the attendance of the new Secretary of State for Business, Energy and Industrial Strategy, and his lead official on science policy, in what will be their first appearance before this Committee.

This is a session on science funding. The Committee has also been inquiring into the Covid pandemic. There are questions that we would like to ask Mr Cummings about the response to the pandemic. He has kindly agreed to give evidence on that to the joint inquiry that we are holding with the Health and Social Care Select Committee on lessons learnt from the pandemic. That will allow us to focus today's session on science funding.

Perhaps I can start with a question to Mr Cummings. What is the problem to which ARIA is the solution?

**Dominic Cummings:** I think there are a few overall problems. First, almost all science funders globally operate in the same way. They have pretty much the same metrics, like papers. They have pretty much the same kind of horrific bureaucracy. They waste huge amounts of time for the researchers in filling out all these forms, and they get pretty much the same results.

Secondly, there are a few examples historically of things that work on completely different principles, and are super-productive, but these sorts of entities, whether it is the Manhattan Project, the old LMB, or ARPA in the 1960s at Bletchley, tend to be destroyed by bureaucracies pretty quickly over time, and the people who run them tend to be driven away. It has turned out to be extremely hard for normal Government systems to learn from the most productive enterprises.

You also have a situation in which issues around science and technology are increasingly important to Government. We have obviously just seen

that in 2020 with Covid. You also have this huge wall of money from China and America coming into it. You have all these different pressures on the system and a Whitehall that has not been configured to think rationally about how to do science and technology policy. Britain cannot solve all these problems by itself, and neither can an agency. A whole bunch of things have to change in the overall system.

What ARIA can do, though, is to be decisively different from all other funding entities. I have a chart done by a brilliant scientist called Michael Nielsen, who wrote a textbook on quantum computers. I hope you can see it. I will put it on my blog if it does not show up very well.

**Chair:** It is on the Committee's website as well.

**Dominic Cummings:** This is basically where all funders are globally, in this bubble here. However, this is the actual design space for how you could do science and technology. 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. That is one of the great lessons of the things that have been most successful historically. That is what produced the internet and the personal computing revolution.

You need to strip out all the horrific Whitehall bureaucracy around procurement, state aid, human resources, civil service pay scales, all those sorts of things, and the huge amount of processes from the Treasury as well—things like the Treasury business case process, which is horrific and causes huge delays in science and technology. There is logic for it elsewhere in the system, but as applied to science and technology it is very damaging.

In a nutshell, I would define the purpose of ARIA as: there is no point creating it if it is going to be another entity in that little red area. The purpose has to be to sample the wider space and to do things very differently.

Q169 **Chair:** And to do that with extreme freedom and busting the bureaucracy that is already there.

**Dominic Cummings:** Yes.

Q170 **Chair:** We will come to some more detailed questions about each part of that. My colleagues have some follow-up questions. I think it is evident that most people accept that the proposal to have a UK ARPA—now ARIA—was yours. Was it something that you proposed to the Prime Minister? Was it part of a deal that you did with the Prime Minister to join him?

**Dominic Cummings:** I would not say it is my idea. All I am doing is suggesting what a lot of the best scientists and technology people in the world have been suggesting for decades: that Britain should learn from some of those examples, including the 1960s ARPA. This is not in any way my idea. Essentially what happened in terms of what you are talking

about is that the Prime Minister came to speak to me the Sunday before he became Prime Minister and said would I come to Downing Street to try to help sort out the huge Brexit nightmare. I said, "Yes, if, first, you are deadly serious about getting Brexit done and avoiding a second referendum; secondly, double the science budget; thirdly, create some ARPA-like entity; and, fourthly, support me in trying to change how Whitehall works and the Cabinet Office works, because it is a disaster zone," and he said, "Deal."

Q171 **Chair:** Where did he say, "Deal"? Where were you when that was concluded?

**Dominic Cummings:** In my living room on the Sunday before he became Prime Minister.

Q172 **Chair:** Just you and him or were there others there?

**Dominic Cummings:** Just me and him.

Q173 **Chair:** And now that you are not there, are you confident that the Government will stick to the four elements of that? One has clearly been done already.

**Dominic Cummings:** As far as I can see from the Budget, the plan is to stick to the doubling of the science budget, although there are some issues around that. I think the fact they brought in the Bill shows that the Government remain committed to doing it. The problem is much less likely to be just the Government deciding not to bother trying to do an ARPA. There is a deeper problem. On the one hand you think, okay, you have got this model from the 1960s. It is so incredibly fruitful that a few hundred million dollars generates tens of trillions of dollars in value with the internet and personal computing revolution, and all the other things that were spun off that. Obviously, human civilisation will learn from that, and try to do the same thing, right? But, in fact, it turns out that that is the opposite of the truth. In fact, what happens is that ARPA, the institution that did that, was itself very much changed in 1975. It became more bureaucratised, which made it much harder to fund things like the internet.

That is the real problem for ARIA. It is not so much a question of whether the Government lose the will to do this. It is more that the principles according to which these sorts of things are very successful are completely hostile to normal bureaucracies. That is why they do not normally happen. Therefore, I think the bigger danger is that it sort of half happens; they create something, but it is basically no different. If MPs were going to choose to do that, they would be better, in my opinion, not bothering to do it at all. The only point in doing it is to make it decisively different from what already exists, otherwise you are just adding to the chaos.

Q174 **Chair:** We will come on to some aspects of that. Isn't there a paradox here about ARIA? It was in the Queen's Speech in October 2019. We are now in March 2021, nearly a year and a half later, and it has not even

begun its passage through Parliament yet. You have just been very critical of the bureaucracy surrounding administration and science funding, yet this institution seems to have the gestation period of an elephant. You were in office for 80% of this time. After the Prime Minister, you were the most powerful person in Downing Street and, some would say, in the country. Why were you not able to make it happen during that time?

**Dominic Cummings:** We made some progress in the second half of 2019 on it, but, inevitably and fundamentally, like everyone else in politics, we were swamped by the Brexit problem. As soon as the election was finished, I started work on this in January. Science funding was the main thing I worked on in January immediately after the election. Then, of course, like everything else in government, everything was swept away for the few months in the first wave of Covid.

You are obviously right to point to the delays. I think it shows, and having had dozens and dozens of meetings on this, that it is connected to the problem I mentioned in the previous sentence. This is so contrary to how the normal system works that it is very hard in Whitehall to push through something like this. After over a year of discussing it, we suddenly had the Treasury come back in September/October-time last year and say, "Hang on a second, we don't want to have primary legislation at all. My God, if we do this and start enshrining in legislation the fact that some entities don't have to follow all of our bureaucracy, where will it end? Everyone will suddenly want to have this wonderful freedom. Maybe we can do this without a Bill."

Q175 **Chair:** The Queen's Speech was in October 2019. Why were you debating whether legislation would be needed when it was included in the Queen's Speech a month earlier?

**Dominic Cummings:** Because after a year of everyone in Whitehall debating it, the Treasury suddenly came back and said, "We have come up with our own different legal advice and we think we don't need a Bill after all, and this is a completely different way of doing it." The whole episode shows just how hard it is for Whitehall to deal with the concept of creating something with low friction and removing things like the Treasury business case.

Q176 **Chair:** A final question from me before I turn to colleagues. In our report we said that £800 million for a new science funding institution is obviously very welcome as long as that is not done by raiding very important existing science budgets and projects. Was part of your deal with the Prime Minister that this should be additional, or did you anticipate that this would come out of other research programmes, including medical research, which has served us so well during this pandemic?

**Dominic Cummings:** It was always very explicit and clear throughout my time in Government that this would be additional money. We made those commitments to the Royal Society, to all the different funding councils and to everyone else. This should all be funded with new money

from the doubling. That was always the original plan. That was the plan throughout my time in Government. Hopefully, that has not changed and, if it has, it should not have done.

Q177 **Chair:** You would not expect that the budgets for UKRI, for example, should be falling, given this commitment.

**Dominic Cummings:** Certainly not. When I left, UKRI was pencilled in, in the spending review, to get very generous increases over the coming years, as it should do.

**Chair:** Thank you very much. I will turn to my colleagues, starting with Graham Stringer.

Q178 **Graham Stringer:** Good morning, Dominic, and thank you for coming to the Committee. Are you pleased with the detail in the Bill that will set up this organisation? When I read it, it looked as though the bureaucrats who you say destroy initiative and innovation in the science world had got their grubby mitts on it. At any time the Government can take control of the organisation, if you look at schedule 1 in the Bill, and there are all sorts of other controls in section 2 of the Bill. Are you pleased with it or disappointed with it?

**Dominic Cummings:** There are too many restrictions. Certainly, in my model of it, you would not have Ministers anywhere near making decisions about how it spends money. I think that would be a disaster. In my model it would be extremely simple. You would find a director. You would have a maximum of four trustees, so they are real trustees and they have real control. It is not one of these normal Government things with about 20 people on a board and no one is exercising serious responsibility for it. You would cut it loose from the rest of the system. So, no, I am not confident about how it will work out.

There is a mix, as you would expect. On the one hand, there are a lot of people who know the history of things like ARPA, Bell Labs and the old LMB and whatnot, who know the value of this kind of model, and who say obviously Britain should do this. There are a lot of brilliant officials who think it is a wonderful idea and who have worked extremely hard to do it. It is also crucial to remember that the basic principle of extreme freedom is completely hostile and completely the opposite of how all normal science funding works, and how all normal Whitehall works.

You MPs have to be extremely vigilant. There is a tendency to think of the science funding system as if there are people running the system. That is not the reality. The reality is the system runs the people. There are huge veto points everywhere. Everyone can block things, everyone can stop good things happening, but almost nobody can get anything done. This chain of bureaucracy runs all the way down from the people at the bottom of the hierarchy in bodies like the EPSRC making decisions about pure maths, through the hierarchy of EPSRC, through UKRI, through BEIS, and then up to the Treasury. You have these chains of business cases and emails running up and down this hierarchy for month after month after month, driving everybody completely insane. If you say,

"Let's completely get rid of that; it makes no sense," some parts of the system say, "Brilliant," and other parts of the system say, "Oh my God, we can't possibly do that."

Q179 **Graham Stringer:** It seems to me that as the draft Bill is at the moment there is less freedom for scientific innovation and new ideas than you would get in a university department, and there is more control. There is no overall mission statement. One of the strengths of ARPA/DARPA when it was set up was that there was an overall mission statement, which was to make the United States of America a safer place. Do you think it is a mistake not to have an overall mission statement? Incidentally, in terms of the detailed objectives in 2(6)(a), (b) and (c) in the Bill, it says to look at the economy, innovation, and improving the quality of life, but there is nothing about defence there. Is that a mistake?

**Dominic Cummings:** As you say, if you look at the original mission statement for the old ARPA in 1958, it was something like to prevent strategic surprise in science and technology for the United States, although those are not the exact words. My version of it here would be, as I said, to accelerate scientific discovery far beyond what is currently normal, and to seek strategic advantage in some fields of science and technology for the United Kingdom. That is how I would define it. I would keep it broad and vague like that.

I would also point out that if you talk to the old-timers who were actually involved with ARPA, and saw the transition to DARPA in 1975, they think that was a retrograde step, and, in fact, DARPA after 1975 had to come up with all kinds of bureaucratic reasons to fund things like the internet in the future. So I would not give it a specific defence focus. I certainly would not try to import a bunch of buzzwords like AI, quantum, net zero and things like that. I do not think it adds anything. I would stick to a broad mission statement, as I have described: sampling this broader design space for science and technology, and achieving strategic advantage for Britain in some fields. That is how I would define it.

Q180 **Graham Stringer:** I do not know if you are familiar with the Howard Hughes research centre just outside Washington DC, which has some of the best scientists in the world looking at the brain and how it functions, trying to make breakthroughs. It seems to me, and I would be interested in your comments, that you are promoting something more like that Howard Hughes centre on the brain rather than a UK DARPA.

**Dominic Cummings:** Yes, I am familiar with that. I actually visited Janelia Farm where that institution is. I brought over a brilliant young British neuroscientist who was working there. He now works in No. 10 and made some critical contributions to how the British Government dealt with Covid last year.

What I am proposing is not to have something that is narrowly focused like that on one area. I would not just aim at neuroscience, or whatever. I would leave those sorts of decisions to the institution, to ARIA itself. I would leave it as a very broad science and technology thing. One of the

crucial lessons for ARPA in the 1960s and 1970s was giving people space for problem finding, not just sending them off and telling them to solve this problem straightaway. Problem finding is as important, and sometimes more important, than solving a problem.

When we create this thing, the people who are running it need space and time to go out and talk to people out on the ground and figure out what these ideas are. By definition, things like creating the internet in the 1960s are not obvious. They are not on the front pages of the newspapers. They are not being talked about in scientific conferences now. They are not on the front page of *Science and Nature*, by definition, so it will take time to go and find these ideas, and find these often very odd people who are pursuing them.

**Chair:** Thank you very much indeed. We will go to Katherine Fletcher.

Q181 **Katherine Fletcher:** Thank you, Dominic, for offering to come and talk to us today. What you are describing is almost like a skunkworks model, if I put it in my language, which is a bunch of incredibly bright people working in the same space and feeding off each other. What do you actually want them to do? You keep saying go and sample, but are you sampling in highly theoretical aspects like aligning quantum mechanics and special relativity, or are you sampling in achieving long-term goals like carbon attenuation, or are you just boiling the ocean with 800 million quid and hoping for the best?

**Dominic Cummings:** It definitely has some similarities with the famous skunkworks in terms of the culture of the organisation. Looking for very extreme talent and having a very extreme antipathy for bureaucracy are obviously two of the key elements of skunkworks. I have deliberately avoided giving my views. I honestly do not think views from me on what sort of thing it should be looking at have any real value. It should be going off to people out on the far edges of the science world and talking to them about what is really valuable.

If you look back at what happened in the early '60s, it was this guy Licklider who said that computing could be done completely differently. He said, "I've got a vision for how we could have personal interactive dynamic computing with everyone universally networked worldwide." He wrote a famous memo about an intergalactic communications network. Those things are hidden. It is not for me to come out and start giving my theories about what they should be. You need to find people who can go off and talk to these people out there and, in particular, search for young people who struggle with funding.

Q182 **Katherine Fletcher:** I was going to come on to that. I have been personally struck by the amount of young bright researchers who are frustrated with the bureaucracy, not least women who cannot plan a family because their funding settlements only run for the next 12 months. What I am bothered about is the fallibility of human beings in this system. If you have a tiny leadership team of a director and four trustees, you are effectively looking for five Sir Patrick Vallances or

Hookes or Boyles or Newtons. How are you going to stop a small number of people getting the wool pulled over their eyes by the tinfoil hat brigade as they come along and say, "If you give me a hundred million quid, I'm going to stop aliens from being able to read our minds"? How do you have in the leadership the technical understanding to not get the money spent badly?

**Dominic Cummings:** On your first point, the youth thing is a critical problem. I will give you a concrete example of that. One of the most influential physicists in Britain in the last 50 years is David Deutsch of Oxford, who wrote the famous papers in 1989 all about quantum computers, which helped start the whole field going. Recently he went back to the people who actually funded him and said, "What would happen if I came to you with my 1980 idea now?" They all said there was no way on earth he would ever get funded now. That sums up the problem you are talking about. It is very hard for young people to get funding for ideas that are far from the normal. Now everyone babbles on about quantum computers as a kind of buzzword.

Q183 **Katherine Fletcher:** But how do you stop the tinfoil hat brigade from pulling the wool over five people's eyes for a lot of money?

**Dominic Cummings:** You have to pick the five people very carefully. The ARPA model is that you have a very flat organisational structure. You have a director in charge of it and they have good taste in finding people. There is no alternative to this fundamental problem. You have to have someone in charge who has good taste in scientific ideas and in scientific researchers. That is how all these institutions worked. It is how General Groves operated with the Manhattan project. It is how Ruina found Licklider in the first place. It is how Licklider found Robert Taylor. It is how Robert Taylor created Xerox PARC in the 1970s. There is no alternative ever discovered on earth to having funders with great taste in ideas and people.

Q184 **Katherine Fletcher:** I would gently point out that all the people you have just mentioned are blokes, and taste is one of those subjective human things that we need to be careful and worry about when concentrating great power in a small number of hands.

Let me shift on to some of the evidence that we have heard from people previously. It was all about culture and leadership and creating brains sparking off each other in interdisciplinary areas, rather than giving an individual maverick the funding to go and produce that. In your view of ARIA, where is that collaboration and that temporary nature, which I thought was very powerful evidence?

**Dominic Cummings:** I think this is a very important point. Academia and universities are terrible at, and the current system is terrible at, funding teams to do certain things. The system now is extremely focused on individual researchers writing papers. It is terrible at funding teams where the output is not a paper, but software, or a tool, or something like that.

One example that everyone in this Committee will be familiar with is DeepMind. Demis Hassabis had to go to California and talk to people like Peter Thiel to get cash to get DeepMind going, because the British funding system just does not think naturally in that way. That is exactly one of the things that ARIA should be able to do. It should be able to say, "Okay, here is a Licklider-type person. They have a vision of how they can build this thing over the next 10 years. They need 50 million quid a year, say, for 10 years. There you go; knock yourselves out." That is exactly the sort of thing it should be doing. I do not think it should be limited to that.

A crucial distinction that is often lost in this ARPA/DARPA issue is that DARPA is very much focused on what are referred to as missions, moonshots and things like that. There is a specific goal and a specific deadline: 1960s Apollo; put a man on the moon by the end of the decade. That is a great model and that can bring fantastic progress for civilisation, but it is not the only way of doing things, and ARIA should not be limited to that.

I would point out that the Licklider vision for personal computing and interactive computing and the internet was not such a moonshot. It was a much more ephemeral thing and much more powerful for being that. It drove decades of research and discovery, and was so rich that you still have now, 50 years later in Silicon Valley, people like Bret Victor setting up new labs saying people have missed this idea from 50 years ago. ARIA should have that kind of freedom to do both things. It should be able to find the Lickliders and fund specific moonshots if it wants to.

**Katherine Fletcher:** I am with you. I could spend ages debating scientific nerdery with you, but I am very conscious that we have a public audience who will be funding this ultimately, so my final question, Chair—

**Chair:** Sorry, Katherine, we need to go to Dawn. I will bring you in a bit later.

Q185 **Dawn Butler:** Thank you, Dominic, for coming to the Committee. Dominic, you spoke earlier about finding scientists from America and bringing them over to work in No. 10. I know you will have thought about this quite intently. Who do you think should be in charge of and lead ARIA, and why?

**Dominic Cummings:** I will give you three people as the sort of people who I would think of. There is a guy called Michael Nielsen. He wrote the textbook on quantum computers. I think it is one of the top 10 cited physics books ever, or something. He has also spent the last 10 years living in San Francisco really thinking about how science itself works. He wrote a brilliant book called "Reinventing Discovery". He would be a perfect person because he has done brilliant science and he knows these people, but, unusually for a scientist, he has actually studied the process and the history of funding and written a book about it. He has seen this intersection of the worlds of science and technology, venture capital,

project management, et cetera, in Palo Alto and places. Someone like that would be a great example.

There is Steve Hsu, the physicist, who has worked in genomics and other things, and is also from the start-up world, again a mix of different backgrounds.

In Britain, there is a brilliant mathematician, Tim Gowers, who won the Fields medal. I think Tim has exactly the right kind of mindset and character and would be a wonderful person to have either running this or to be chairman of it if he would not run it. There is a brilliant physicist called Chiara Marletto, who is one of David Deutsch's students. She is a classic example of a young female scientist who is struggling for funding now but has brilliant ideas. Those are the sorts of people who need to be involved in this kind of entity, I would say.

Q186 **Dawn Butler:** Obviously, these are people you know and you talked about having scientists on the edge, the wild cards and the misfits, the people that you really like. This is going to be your legacy. How will you stay involved?

**Dominic Cummings:** I will not be involved. I am not seeking to be involved. I would not want to be involved. I should not be involved.

Q187 **Dawn Butler:** Why shouldn't you be involved?

**Dominic Cummings:** Well, the only way I could add any value to it would be if you picked the wrong people in the first place. If you pick the right people, what could I possibly contribute to it?

Q188 **Dawn Butler:** So, if you were offered a position, you would not take it.

**Dominic Cummings:** I know there are some rumours around about that sort of thing, that No. 10 has asked me to do it, or whatever. I do not know if they are thinking about that, but, if it were suggested, I would certainly say no.

Q189 **Dawn Butler:** Do you consider eugenics to be a science, and do you think it needs more research?

**Dominic Cummings:** I do not really know what you mean by eugenics. There is obviously a huge amount of work now going on in genomics in understanding how the genome works, and there is a huge amount of work happening in genetic engineering and technologies like CRISPR, which have huge promise and the potential to cause huge disasters. I certainly think that one of Britain's great scientific advantages is our leadership in this field, in genomics, genetic engineering and things like that. That advantage has proved extremely valuable in Covid. I think we have been one of the leading scientific countries in sequencing different variants of Covid, if not the leading country. I strongly think that that fundamental science research should be funded here.

Q190 **Dawn Butler:** Why isn't ARIA a division of UKRI? Did you not see that in your brainchild idea when you were putting it all together, even if it is a

sub-arm or remote arm of UKRI?

**Dominic Cummings:** No, I think that it should definitely not be part of UKRI. Ottoline Leyser, the director of UKRI, agrees with me. UKRI is a young organisation. It has done some excellent things, but it also suffers from this very extreme bureaucracy problem. I had to spend a lot of time last spring, for example, dealing with blockages in the funding system to therapeutics that were necessary for dealing with Covid, and there were lots of blockages in the system then. It is one of the many reasons why we chose to do the vaccine programme the way that we did.

If you are going to put it inside UKRI, then don't do it at all, would be my advice. As I said before, the only justification for doing this is if you do it outside of the existing system and processes. If you are just going to put it inside UKRI, all you are doing is adding to the bureaucracy. Everyone would be far better off just giving UKRI the money and not bothering to create it. I would just stress that Ottoline, having been there, agrees with this.

Q191 **Dawn Butler:** You said in January that this was the main thing you worked on: the science, ARIA. Is that the reason why you were given the £45,000 pay rise?

**Dominic Cummings:** No. The media reports about me getting a pay rise after Covid are wrong. It is true that I interfered with the pay system regarding my own pay, but that was in summer 2019. When I arrived, I was put on the normal pay band for my position of £140,000 something. I said that I did not want that and I only wanted to be paid what I was paid at Vote Leave. I figured I should be paid the same for trying to sort out the Brexit mess as I had been paid for doing Vote Leave, so I asked for a pay cut, which is what happened in summer 2019. For some reason this has appeared in the media as if I got a pay rise after Covid, but that did not happen. When we were all rehired on the day after the election, I moved back on to the normal pay grade for my position.

**Dawn Butler:** That is interesting. Thank you for clearing that up. Thank you very much, Dominic.

Q192 **Aaron Bell:** Thank you, Dominic, for coming in today. I must say I agree with what you were saying to Graham earlier about the risk of bureaucracy. It strikes me that a lot of the examples you gave about how this has worked well in the past—the Manhattan project, DARPA itself—stem from an existential sense of crisis, whether the second world war or the cold war. A couple of years ago the Government looked at the grand challenges of AI and data, an ageing society, clean growth and future mobility. Those were all challenges, but I do not think they were ever felt to be an existential crisis. We have just been through an existential crisis, which has seen huge innovations, particularly with mRNA vaccines. Without the crisis, will ARIA really work?

**Dominic Cummings:** That is a very good question. You are right that historically these things tend to be created and only given extreme freedom when faced with some kind of existential crisis. I would hope in a

rational world that the disaster of last year ought to make the case for ARIA completely open and closed. Remember in February, March, April last year there was no entity in the British state—zero entities—including the Prime Minister himself, that could make rapid decisions on science funding minus horrific EU procurement, state aid, laws, et cetera, et cetera. There was no entity in the British state that could operate at scale and at pace. That was obviously disastrous.

It seems to me that one of the most obvious lessons of last year is that, first, we should go to extreme lengths to try to debureaucratise the normal system. Secondly, we have to accept that there are always going to be certain sets of rules for certain sorts of things. You need to have an emergency process where an entity of the state can move at speed and scale to do all sorts of things—buying, procurement and whatnot. It also makes the case for creating an institution like ARIA.

I have deliberately tried to not get into my own ideas for what sorts of thing you would fund, but it seems to me obvious that one of the things that should be funded now is a combination of mass distributed testing at home, mass distributed genetic sequencing, mRNA vaccines and the supply chains to scale them up. If you look at the guy who ran the US biosecurity programme—so he was responsible for dealing with the suspicion that North Korea is trying to develop smallpox and stuff like that—he recently said that, if you talk to the top scientists in the world, people like George Church, there is a road map for how over the next five to 10 years you could build infrastructure to deal with pandemics so we do not have the kind of disaster that we saw last year. That is the sort of thing that should be the impetus for creating an entity like this.

Q193 **Aaron Bell:** Does that not make a case for potentially making the Department of Health or the NHS itself the client for ARIA, in the same way that the Department of Defense was for DARPA?

**Dominic Cummings:** No, I do not think so. All Government Departments need to take science and technology far more seriously than they have done so far, and have better funding for it in their normal provision. They should also all have a small pot of maybe 5% of the budget that goes to funding people who are thinking very long term and are on the edge. There is an argument for the Department of Health, for example, having an entity that could do that. Obviously, last year, we saw the Department of Health had a total disaster in terms of buying: how it buys, how it procures, how it does its science and technology. That is why we had to take the vaccine process out of the Department of Health. I do not think that leads you to the conclusion that you make the Department of Health the client for ARIA. I think ARIA should be broadly defined and should be able to look at challenges and problems across the whole domain of science and technology.

Q194 **Aaron Bell:** You have made clear that leadership is vital to ARIA. If we get the wrong leadership, is it your expectation that it will just end up becoming another arm of what we have at the moment, which you have said is undesirable and we might as well not do it at all?

**Dominic Cummings:** Yes. There is a strong argument against this whole concept. It was interesting when I was talking to some of the old-timers who were part of the original project and funded by Licklider and Robert Taylor themselves. They have won Turing medals and God knows what, and they said, "One of the weird things about this world is that it seems like great funders are much rarer than Nobel prize winners and Turing medal winners." It would seem that people like General Groves and George Mueller, who did the Apollo programme, and Bob Taylor are very odd people. I think that is the chief bottleneck in this kind of thing and the most obvious way in which it will fail. If you get some bog-standard vice-chancellor and put them in, it will not work.

Q195 **Aaron Bell:** You wanted weirdos and misfits with odd skills in the civil service. Clearly, ARIA is designed to encourage those people in the science sphere. Without going into what happened with the civil service, do you think, if ARIA works, there will be lessons to read across from it to other aspects of the state, including Whitehall?

**Dominic Cummings:** Yes, unquestionably: 2020 was proof that, if you do not have people with scientific and technical backgrounds who understand how to think rationally and quantitatively about extreme uncertainty, you can very easily have disastrous decisions. Bringing people with those skills into that decision-making process helps you avoid disasters. I am sure that if you create ARIA in the right way, it will have a very positive effect on British science in general.

It is interesting how much support there is for it globally. Lots of these people have read the old books. They know what happened in Los Alamos with General Groves. A lot of them know what happened with Licklider in the 1960s. Everyone can see the personal computing and internet revolution staring them in the face. Scientists themselves know how horrific the current system is, and particularly how terrible it is for young people. I keep stressing that. It is terrible for young people.

The strongest supporters of this I have found are not necessarily very high-status people who already control powerful labs and have huge amounts of money. For lots of them the system works fine as it is. That is not good for British science, and it is not good for the world. If you had Newton or Darwin or Turing turning up now with their ideas aged 21, everyone in the current system would say, "You're mad. Of course we're not funding you." We have to have a system that is open to people like that.

**Chair:** We are going to come to some broader questions of science funding and that is a useful introduction to that, but I want to take a quick question from Carol, who will have a question later on as well, and I said I would come back to Katherine.

Q196 **Carol Monaghan:** I would just point out that Newton and Einstein's ideas were sneered at whenever they first presented them. Dominic, you have talked this morning about the extreme freedom to go ahead and explore ideas. The events of the last year in the pandemic have taught us

that there must be checks and balances where public money is concerned to ensure that cronyism is not the overriding decision maker. How do we avoid extreme freedom leading to extreme cronyism when we are looking at funding?

**Dominic Cummings:** I am sorry, I missed the very beginning of that, but I think your question is: does extreme freedom mean extreme cronyism? Is that right?

Q197 **Carol Monaghan:** If we are talking about spending public money, how do we ensure that extreme freedom does not mean it is being spent without checks and balances, and that it is not just going to those who have the connections?

**Dominic Cummings:** I think that looks at the problem the wrong way round. We have a procurement system that was created by the EU framework and then gold-plated by Whitehall. I and others said repeatedly before 2020 that this system is an expensive disaster zone and when it hits a crisis it will completely fall over. That system hit a crisis and it completely fell over. The justification for this system supposedly was that we have all these processes and, yes, it might be a bit slow, but we can be sure it is all very proper and whatnot. Learning the lesson from, okay, we have got an extremely bureaucratic system that cannot cope with the crisis, to make it more bureaucratic and have more process is the exact opposite lesson that I would learn.

If you go back and look at the history of, say, the Manhattan Project, one of the interesting things was that, when Congress looked at all of the accounts for it after the war, not only was everyone completely gobsmacked by how productive and what an amazing achievement it was, they were also completely gobsmacked by the fact that General Groves ran round the country handing out something like 2% of US GDP, often with only a handshake. There were absolutely no lawyers involved and no processes at all. Congress was astonished to see not only how super-productive it was but also how completely free of cronyism and corruption and everything else it was.

In the 1960s, the Pentagon went in the opposite direction and brought in these hugely laborious procurement processes, and that is what created this nightmare of corruption and cronyism in the whole US defence industry from which it is extremely hard to escape. So, again, if you look—

Q198 **Carol Monaghan:** May I interrupt you for a moment? When you are talking about the Manhattan Project, you are talking about a project that had a specific target. You are not talking about a body with a specific target, so it is quite a different entity that we are discussing today.

**Chair:** Briefly on that and I will bring Katherine in.

**Dominic Cummings:** With respect, I do not think that is quite right. You are right that Manhattan had a specific target of creating a nuclear device before Hitler, but exactly the same argument that I am making applies to

Licklider and ARPA in the early 1960s. It was not an Apollo-type mission. It was a one-sentence vision statement from Licklider about interactive personal computing and networking everybody globally. That and PARC, and the old LMB at Cambridge, showed how you can have extremely low-friction scientific funding, which is super-productive and has no taint, or has much less cronyism and much less corruption than normal bureaucratic systems. The current, existing systems massively reward high-status, well-connected people.

**Chair:** I promised I would come back to Katherine Fletcher and the final question in your mind on ARIA.

Q199 **Katherine Fletcher:** Apologies, colleagues, I shall be brief. I will happily wear a badge that says I am a bit of a scientific weirdo. I broadly accept the idea that we need a skunkworks policy to get the fruits of the British genius and what we can come out with, but what that will imply is a failure rate. Could you give the British public an idea of what a good success rate looks like if this new ARIA body funds 100 projects?

**Dominic Cummings:** You are completely right. Everybody who has been involved in these sorts of things at a very high level has said to me, essentially, if it is not failing, then it is failing. It has to fail, and quite a large percentage of what it does should fail—should not work. If that is not the case, it is not taking enough risks, and it is not properly sampling from the design space that it should be sampling from.

Alan Kay, who is one of the old-timers still alive in his 80s, who has written about the original ARPA and PARC and created a lot of the technologies that your phones and whatnot use, uses the analogy of baseball. If you are batting 300, then that is fantastic. That is the sort of—

Q200 **Katherine Fletcher:** Unfortunately, the British public are probably not as familiar with baseball as they should be. Just give us an out of 100. We can do cricket.

**Dominic Cummings:** If you applied that to 100 projects, and you took the Alan Kay theme, perhaps you would say a third of them are working out brilliantly and two thirds are not. Probably it is more extreme than that. If you look at venture capital now, which is actually an easier business than the business Licklider was doing, or what General Groves was doing with Oppenheimer, almost all their returns come from a tiny number of successes. Even for the very best venture capital companies, half of what they do totally fails, and a lot of what they do largely fails. Almost all their returns come from a tiny number of successes. I think that is the sort of approach that ARIA needs to take. That is the whole point of having an institution like this. The crucial point there is that you learn from what is failing.

Q201 **Katherine Fletcher:** What you are almost saying is that a success metric is the percentage of failures.

**Dominic Cummings:** It is one of them. That is what the people who have actually been part of a successful project like this say to me.

Q202 **Chair:** Thank you very much, Katherine. We are going to move on to science funding more generally. In terms of the ambitions that you have set out that you have for ARIA, is £800 million, which is a lot of money in the scheme of things, adequate for the scale of ambition and purpose that you have in mind for this organisation?

**Dominic Cummings:** It is not, but I think to begin with it is fine because this thing will take time to scale up.

**Chair:** It is [*Inaudible.*] rather than the final say.

**Dominic Cummings:** If you look at US DARPA, it is \$3 billion a year. If you are thinking about this over a 10-year period, the way I would look at it is you can scale it up with a few hundred million. You watch what happens and you have in the back of your mind the idea that it could get to £3 billion to £5 billion a year-type size in the future, but with one big caveat. It depends enormously on whether you are going to use this organisation to do specific missions. If you took the example I gave earlier on of how you stop something like Covid happening again, and you say there is a set of challenges on a five-year or 10-year timescale around testing, sequencing and mRNA vaccines, et cetera, I think the current budget that some people talk about in the States for that sort of thing is, say, 20 billion quid over 10 years. It enormously depends whether you are going to give it some things like that. For example, are you going to ask it to look at some specific things around net zero, direct air carbon capture and things like that?

Q203 **Chair:** [*Inaudible.*].

**Dominic Cummings:** Exactly. If you are saying, "Here is a pot of money. Your job is to find people like Licklider, Darwin and Turing in their early 20s with ideas that could change civilisation completely," you do not need a huge multi-million-pound budget for that—quite the opposite. I would stress that the original funding that created the internet and personal computing was only a few hundred million dollars over 15 years. That has created tens of trillions in value. You do not need huge inputs. For ARIA to succeed, the freedom is much more important than the amount of money. If you are spending large amounts of money in the same way as we are doing now, you will just get the same things.

Q204 **Chair:** After the critique you have given of the UK funding system with all its bureaucracy and frustrations, is it a reasonable charge that you have not been ambitious enough? You have concentrated on ARIA, which is going to be a tiny proportion of the total, rather than using your time in office to get to grips with the main problem, which is, we hope, the £22 billion of funding that you have just described that goes through a system that is totally unfit for purpose.

**Dominic Cummings:** In 2020 I spent a lot of time on this idea, but I spent far more time on the general problem. I think you are right.

Obviously, it does not make sense for us all to spend our time on creating one new agency when, even if we get it right, the rest of the system is stuck in all the terrible ways it is currently stuck. I completely agree with you. The good news is that Ottoline Leyser is both a brilliant scientist and understands a lot of the bureaucratic problems. There are a lot of brilliant officials in BEIS who understand what the problems are and were very supportive of me and others in No. 10 in trying to fix that. There was a lot of thinking about how this could be done.

If I were you, I would definitely encourage this Committee to say that Ottoline and Kwasi should be reporting regularly on the debureaucratisation of the overall system. The single biggest problem I think you will have there is some senior people in the Treasury. There is a brilliant chief scientific adviser in the Treasury called Phil Duffy, who is a great supporter of fighting bureaucracy, but there are also powerful figures in the Treasury—civil servants—who are not at all fans of this. That is probably where your main problem will come.

Q205 **Chair:** What about in No. 10? You have said that doubling the science budget was part of the deal that you did with the Prime Minister when you came in. You are no longer there. Is there enough support for this in No. 10 to help Ottoline Leyser and Phil Duffy in the Treasury pursue the debureaucratisation you describe?

**Dominic Cummings:** I do not know is the answer to that. I hope that as the country emerges from the current lockdown, and as there is and as there should be an urgent, very hard look by this building into what went wrong and why in 2020, one of the most obvious lessons of that is this problem. It is the incredible value potentially in getting the science and technology stuff right and the disaster that can come if you do not get it right.

Also, I would encourage people to think about the fact that it is not coincidental that the vaccine programme worked the way that it did. It is not coincidental that to do that we had to take it out of the Department of Health. We had to have it authorised very directly by the Prime Minister and say strip away all the normal nonsense that we can see is holding back funding.

Q206 **Chair:** When you say, “we took it out of the Department of Health,” who is “we”?

**Dominic Cummings:** No. 10 took it out of the Department of Health. In spring 2020, you had a situation where the Department of Health was a smoking ruin in terms of procurement and PPE and all of that. You had serious problems with the funding bureaucracy for therapeutics on Covid. That was the context for it.

Patrick Vallance then came to No. 10 and said this should not be run out of the Department of Health; we should create a separate taskforce. We also had the EU proposal, which was an absolute guaranteed-to-fail programme, a debacle. Therefore, Patrick Vallance, the Cabinet Secretary, me and some others said obviously we should take it out of

the Department of Health and obviously we should create a separate taskforce. Obviously, we had to empower that taskforce directly with the authority of the Prime Minister.

At that time, as well, you had some very smart people like Bill Gates saying, "Don't do this in the normal way. Start building, like the Apollo programme," exactly like that; learn the lessons from that concurrency. So start building things like the supply chains and manufacturing capability now. Normally, it is a sequential process where you figure things out, you do tests and you do manufacturing and distribution and everything else. What Bill Gates and a lot of other people said was try to smash all these different things together and try to do them in parallel, but to do that we needed to have a different structure.

**Chair:** We look forward to going into more detail on that as part of our joint lessons learnt inquiry with the Committee on Health and Social Care. On the science funding system as we have it, let me turn now to some of my colleagues, starting with Chris Clarkson.

Q207 **Chris Clarkson:** Thank you for coming today, Dominic. Obviously, you have already focused on the fact that there is a problem with bureaucratisation, and I love the word debureaucratisation. But how effectively do you think the R&D system that currently exists, including UKRI, is working in the UK? What is actually working and what is not? You have already talked about it being a very vertical structure and having a much flatter structure for ARIA. What key takeaways are there from what is already there about what does and does not work?

**Dominic Cummings:** You slightly cut in and cut out there, I am afraid, so I could not hear brilliantly what you said. I think what you are saying is, what is wrong with the current system around university funding and UKRI and stuff like that?

Essentially, the output that everyone is looking for is pretty much identical. It is metrics like: is this going to be a paper and is it going to be a paper in a high-status journal like *Science and Nature*? The decisions are all made by peer review committees. This forces decisions very much to conservative, cautious incremental ideas. It is why, as I said earlier, that David Deutsch, one of the great physicist pioneers of the last 50 years, said he could not get funding now, in the current system, for his ideas from 1980, and the people who approved this funding then said there is no way they would be able to do it now.

Everyone is looking at these same metrics. You cannot have software as an output. You cannot have a tool like arXiv as an output. You have the same kind of peer review committees looking at everything and all the different entities that you go to basically operate in exactly the same way. There is no one that you can go to and say, "Look, what I'm doing doesn't fit into a standard metric."

I will give you an extreme example that I have just spent time trying to solve. It is an extreme example of the kind of problem that you have

where it makes no sense. When I arrived in the summer of 2019, if you were applying for pure maths, you had to fill out a thing called an impact assessment. Anybody involved with pure maths will know this is completely and utterly nonsensical. Asking Turing to fill out an impact assessment in 1936 on his paper would have been completely impossible, but in fact the impact is, "Oh, you create digital computers; you have Enigma, and it is involved with beating the Nazis and everything else." These things are completely unpredictable in advance. It does not make sense to get these people to write these ludicrous forms.

It took me literally 18 months just to change that. Twice we were all told that it had been changed and twice it somehow crept back into the system even after it was deleted from the system. Dotted all the way through are these completely crazy things that it is extremely difficult for the system itself to try to fix. That pushes everything towards incremental improvements and extreme conservatism. Give money to a lot of high-status men who already control powerful organisations: don't give it to young people with new ideas. I think that is at the heart of many of the current problems.

**Q208 Chris Clarkson:** Would it be fair to say the issue is that there is far too much process and not enough emphasis on outcome?

**Dominic Cummings:** Exactly. Everyone is emailing each other about these absurd processes for literally month after month after month after month. No one has the authority to say stop.

**Q209 Chris Clarkson:** Taking that to its logical extreme, would you say that we need a complete restart of the R&D process, an entirely new model, or is it a case that ARIA will sit alongside what is already there and possibly drive best practice?

**Dominic Cummings:** I would not say that you have got to completely tear up the existing system and start again, but if you are going to change this you have to have senior people tasked with the authority to say, "We are going to wage war on process." If you do not do that, it just does not happen. I spent a vast amount of my time last year dealing with this problem. There were media stories that I was running around trying to have culture wars with the BBC and whatnot. In the real world I spent a huge amount of my time dealing with exactly this problem.

It is really important to understand that everyone has vetoes over everyone else in the system, but almost nobody has the power to say, "Just stop doing this insanity." Last year, for example, when the Treasury tried to have this business case process for how pure maths should be funded, the whole system spent literally eight months sending emails to each other, driving everybody insane. Finally, I got the Treasury officials and some other people in a room and said, "What on earth is everyone doing?" The Treasury were sheepish and said, "We've made a mistake on this. We should drop it. We are embarrassed." It takes months and months and months of meetings and whatnot to do that. That is even when you are sitting in the Prime Minister's office saying, "The Prime

Minister wants this to happen." It is still incredibly hard, in a practical way, to remove bureaucracy from the system.

You will only get it if people like Ottoline and Kwasi are tasked with that by the Prime Minister, and by the Chancellor, and then the Chancellor says to senior Treasury officials, "No, we are deadly serious about this. We are not having a repeat of 2020. In all sorts of ways the system is going to change."

Q210 **Chris Clarkson:** Obviously, it is going to be a much smaller structure, which is fine by me, but what safeguards do you envisage being built into that? At the moment there are layers and layers of bureaucracy. These emails are pinging backwards and forwards, and somebody says, "That's a ridiculous idea; we are not doing that." If you have somebody with good taste in science, are they going to be the sole determinant of what goes ahead and what does not, or is there going to be some kind of buffer built in there to say, "Actually, no, that is a good idea," or, "No, that is absolutely crackers"?

**Dominic Cummings:** Again, I slightly struggled to hear what you are saying, but I think the answer to what you are saying goes to a critical part of this. If you go back to how Nick Ryder got his funding in ARPA and how Bob Taylor got the funding to do the internet, both of them involved basically wandering into the director's office and having a chat, and the director saying, "That sounds like a cracking idea; go and do it." That was the famous conversation with Robert Taylor in 1967, or whenever it was, on the ARPANET.

The critical thing if you are going to do things differently is that individuals have to be able to place bets, not committees. As soon as you have committees, and a pursuit of consensus, automatically it is impossible to fund these sorts of things.

Q211 **Chair:** Is one way to deal with the bureaucracy rather than it going through national organisations to direct the money straight to universities for them to exercise at their discretion?

**Dominic Cummings:** It can be. It has definitely been a strength of ARPA and DARPA that they do not empire build themselves. They do not build their own labs. I would strongly recommend that ARIA does not build its own labs but funds other people, so that you avoid the empire-building problem.

However, it is also the case from all my laborious investigations last year on this subject round the Cabinet table that universities themselves are also a massive source of bureaucracy. In my opinion, one thing that should happen is that the Government should be very aggressive with universities and say, "We have a lot of money to hand out. We are going to double the science budget, but you have to do your part. You have to remove all the following nonsense from your maths, physics and engineering departments if you want our cash." You have to create some really strong incentives for the universities, because at the moment the universities themselves add another layer towards all this process horror.

Q212 **Chair:** In terms of the deal, doubling the science budget was part of the deal.

**Dominic Cummings:** Yes.

Q213 **Chair:** At the same time the negotiation with the EU was going on, including on our potential participation in the Horizon programme. Was it intended that the subscription to Horizon would be deducted from the science budget that was previously paid for as part of our EU subscription?

**Dominic Cummings:** Over the 18 months from July 2019 onwards, there were incredibly complicated discussions about the whole Horizon thing. My basic view of it, which I suggested—and David Frost tried to do this—was to go to the EU and say, “Listen, let’s just take all the science stuff off the table and separate it from the main negotiations. We can all agree that this will be better for European civilisation and the world if we can do a separate deal on science.” Brussels would not do that. It insisted on keeping science as part of the whole overall deal, so it got enmeshed in the whole process with Barnier.

My essential view was that we had a moral obligation, and the Prime Minister committed to this, that Brexit would not take away a single penny of any existing funding. That was my very strong view. It might be in the manifesto. I certainly tried to write it into the Conservative Party manifesto. I cannot remember now. Perhaps I am going mad and have forgotten. I hope it was in the manifesto.

Q214 **Chair:** That was your clear understanding of what the deal was.

**Dominic Cummings:** Without any question. The Prime Minister definitely said a few times that, whatever happens in terms of the EU negotiations, British science will not lose a penny and we will find the money to make that work, and that is obviously what should happen.

Q215 **Chair:** The same question on ODA funding. I do not know if you were in No. 10 when the discussions about having a temporary cut to ODA funding were taking place, but a lot of that funds science research. Was it intended that that should reduce the science budget?

**Dominic Cummings:** It was certainly not intended by me, no. There was definitely a strong argument that the Chancellor made for making a temporary reduction in the ODA budget overall. My view was that, because of how budgets are done, there is a natural tendency in Whitehall to try to double count things; to say, if we put £1 in that pot, it counts for ODA and science, and for this, and for that. My view very strongly was that whatever we did, whether it was Horizon or ODA, it should not be subject to Whitehall accounting gimmicks.

Q216 **Carol Monaghan:** I am struggling to understand you. You have given particular examples of difficulties with the existing funding system. I am struggling to understand why you consider the best way of tackling difficulties with how science is currently funded is by setting up a whole new, different agency. We are talking about a small amount for this

agency; £800 million is a small amount of the overall science budget. Surely we would be better dealing with the vast majority of science funding and how it is allocated within UKRI rather than tinkering about with probably less than 1% of what we have in order to set up a new agency. Could you explain that?

**Dominic Cummings:** Obviously I was not clear before. I do not think at all that all the focus should go on creating a new agency. I do not think it is either/or. I made more efforts last year to try to deal with the overall system than I did trying to create a new agency. It is not either/or. We certainly have to make huge efforts to improve the basic systems. The problems that we had last year dealing with Covid make the case extremely eloquently for why the overall general system must change. You could also have a small niche entity that is free of all the existing rules and regulations. I do not think it is an either/or. I think there is more than enough money to be able to do both.

Again, I would stress what I already said. It does not need huge amounts of cash. The computing research in ARPA in the 1960s and 1970s was a few hundred million dollars in today's money. It does not need huge amounts of money. The really critical thing is the freedom for people to act in a low-friction way.

Q217 **Carol Monaghan:** You were very keen that science funding was increased significantly. What were the key threats that you considered that required this additional spend of money?

**Dominic Cummings:** If you go back and look at what I have been writing over the last 10 years, there are lots of things about how there are tremendous opportunities to invest in science and technology to change the world for the better. We also need to make this a core focus of the British state, because, if we do not, it is incredibly dangerous.

Back in June 2019, only a month before I went into No. 10, I wrote a long article about science policy, about decision making, about expertise, about how the Cabinet room would collapse in a serious crisis because of how it was set up, et cetera. If you do not take science and technology seriously, and you do not have the kind of skills needed in the apex of power in the state, it can be extremely dangerous. You have these dangers multiplying all the time. You have dangers on pandemics and on engineered pandemics. You have the problems of the last 70 years. Today you still have nuclear weapons that launch on warning, which is a massive nightmare.

In a positive sense in the value you can create, and in the defensive sense of the disasters you can avoid, I have been arguing for 10 years that science and technology should be seen as a core part of what the Prime Minister's job is. In fact, at the very last meeting I ever had, the last discussion I had with the Prime Minister the day that I left Downing Street was on this subject. It was about how to change bureaucratic structures inside No. 10 and the Cabinet Office so that you make science and technology a core part not just of the current Prime Minister's job but

all future Prime Ministers' jobs. Obviously, I have been saying this for 10 years. I think the last year just makes it obvious.

Q218 **Carol Monaghan:** I do not think any of us in this Committee would disagree with the importance of science and technology. The Government have set a target of 2.4% of GDP. Is this realistic?

**Dominic Cummings:** I do not know. I also do not think it is enough. For me, the doubling was only a first step. Doubling the science budget is a critical and good thing. Improving how the general system works alongside it is necessary so that money is not just wasted. In brackets, I would point out that the NIH doubled its budget in the States over the last 10 or 20 years, but it did not change how the money was spent and, therefore, doubling it has had no impact. Changing how the money is spent is more important than increasing the budget. Long term we should be looking at more than the current plan. I think we should be looking at having much longer-term budgets.

The other big problem inside UKRI, and one of the big differences between UKRI at the moment and the normal science funding process and great entities like the 1960s ARPA or Bell Labs, is its inability to plan long term. That is incredibly damaging for science. It should be aiming at 2.4%. The Government should be doing their part in that. The Government should be spending proportionately at least as much as the countries around the world that are doing the most on this, places like Korea, China, et cetera. Instead of languishing at the bottom of the G7 or G20 lists, we should be aspiring to be at the top of those lists. I stress that how the money is spent is even more important than just increasing the amount of money.

Q219 **Chair:** We will now go to Rebecca Long Bailey, but, first, I would pick up on the point you made to Carol. Your last conversation with the Prime Minister was about moving the administration of science into the Cabinet Office, presumably from BEIS; is that right?

**Dominic Cummings:** Yes.

Q220 **Chair:** Conversations are two way. Did the Prime Minister agree with that proposal?

**Dominic Cummings:** Yes. There was a note I wrote with Patrick Vallance, which I gave to the PM in my very last conversation with him, that said he should approve this. He gave it back to the Private Secretary and said, "Approved," so hopefully that is what is happening. The Cabinet Secretary, Patrick Vallance, Ottoline, me and various other people had a lot of discussions last year, obviously partly in a learning lessons from Covid way, about how the centre of government thinks about science and technology, about this basic problem of how to co-ordinate across the whole system when you have warring Departments and multiple veto points, multiple bureaucracies locked with each other. and no one being able to break logjams. That is why Patrick Vallance, the Cabinet Secretary and I said the current system is obviously no good, and it should change very significantly. The current Cabinet Secretary is a

strong supporter of making science and technology core to the job of the Prime Minister for the future.

Q221 **Chair:** So the proposal is to bring it into the heart of government under No. 10 as per the response to the learnings of the pandemic but also to deal with the increased scale of investment in science.

**Dominic Cummings:** Exactly. With the best will in the world, a junior Science Minister at BEIS cannot look across the whole system and have authority in terms of how Whitehall works. We can have a theoretical conversation about what is the platonic ideal of how to do this, but that is not the situation that we were in last year. What I was looking at was what is practically just about possible, given how Whitehall currently operates and the whole departmental structure and whatnot. Unless you rip up much more fundamental things about how Whitehall works, which personally I would be in favour of, you need a way for the centre to be able to look at what the big challenges are. You have huge, net-zero obligations and action coming through. You have huge defence and intelligence obligations. You have the normal science budgets. You have the Covid response. You have all these sorts of things.

The current system has had no way to co-ordinate thinking about all of this; to think what the real priorities are and then project manage them through the system, and drive it through Whitehall. That cannot be done by junior BEIS Ministers. In the current system it is extraordinarily hard even for the Prime Minister's Office to get anything like this done, as last year showed, but it certainly has no chance of happening unless it has the authority of the Prime Minister and the Chancellor.

Q222 **Rebecca Long Bailey:** Thank you, Dominic, for coming to speak to us today. You have been very diplomatic on Government funding so far. The possibilities emanating from an ARPA-style body could be immense. The initial £800 million for ARIA, which incidentally has been pushed back now to 2024-25, is not a vast amount of money when you compare it to the nearly \$3 billion the US spends on DARPA, as you mentioned earlier.

In the Budget itself this year there was no additional funding announced for ARIA, and further announcements on science funding were also scarce. Indeed, the Treasury has not made any funding available to support the UK's association with Horizon. This will need to be met from existing science budgets. The ODA allocation to UKRI has reduced significantly leading to £120 million-worth of shortfall.

What did you make of the Budget in relation to R&D? Do you think the Government are being ambitious enough, or are they at risk of watering down your ambitions? Certainly on the ODA and Horizon points, they seem to be doing the opposite of what you would like to see, based on your comments today.

**Dominic Cummings:** I did not watch the Budget and I do not have any idea what was in it. I will take obviously what you say as fact. If UKRI budgets are being cut, that is obviously an extremely bad decision. I do not know why that would have happened. In the documents that I had

with the numbers pencilled in when I left in November, UKRI was getting very generous improvements to its core budgets, not just for this year but throughout the whole spending review period through to 2025. If that has changed in the last 12 weeks, that is obviously bad. If there have been dodgy accountancy tricks with ODA and whatnot, I agree with you that is also bad. If 2020 is not enough of a galvanising shock to say that we ought to take science and technology seriously, and both fund it properly and embed it in Government decision making intelligently, and strip out the bureaucracy that causes so much harm, I do not know what would be.

**Q223 Rebecca Long Bailey:** You did not need to watch the Budget. You did not miss much when it comes to science and R&D. It is interesting that the Government have said that they were committed to making the UK a global science superpower and that their R&D funding plans would help accelerate our ambitions to reach 2.4% of GDP spent on R&D by 2027. However, with the recent Budget, and the scarcity of increased funding for science, there is a real worry that the 2.4% figure, which I agree with you is not big enough anyway, could simply be met by the collapse in Britain's GDP since the pandemic started rather than a real-terms increase in funding.

My question to you is: do you think that the Government's intentions are to rely on meeting the 2.4% target through falling GDP? What would you like to see the Government do going forward in terms of real R&D funding? You have said that 2.4% is not enough. I agree. What percentage of GDP should we be spending on R&D?

**Dominic Cummings:** I stress I do not know what decisions were made after I left and I do not know what was in the Budget. I know that Rishi himself was always a very strong supporter of R&D spending in arguments between No. 10, the Cabinet Office, the Treasury and different parts of Whitehall over the nine months or whatever that he was Chancellor. Rishi always said that the two big things he wanted to prioritise were science and technology spending and the skills agenda, to try to solve that century-long problem. So I think he is definitely personally committed to it.

I would not focus too much on GDP at the moment. Obviously, the GDP numbers are bouncing around all over the shop because of last year. I do not think that is the target to aim for. Personally, I would look at what the absolute numbers are. I think it would be completely crazy to say that GDP has taken this huge hit from Covid; therefore, 2.4% of it is much less; therefore, we can cut science spending but still somehow say that we are meeting the target. That would be completely insane. What we should be doing is looking at real-terms budgets and increasing them up to the £22 billion that was originally envisaged and committed to back in March.

As to where it should go in the future, I think others will have a much better idea than me about what that should look like. It is obvious that places like China and Korea are taking science and technology much

more seriously than Britain has done over the last 10 years. It is obvious that David Cameron and George Osborne did not take this remotely as seriously as they should have done. They did not fund it as seriously as they should have done, and we have paid a price in all sorts of ways, in my opinion, for their terrible decisions.

Now we have a situation where China has said it is going to spend vast amounts of money over the next 20 years, particularly on things like AI. The Biden Administration are reversing Trump's trajectory and are saying they are going to spend a huge amount of money as well. There is going to be a lot of pressure on Britain. There will be pressure on where great talent will go. To some extent, British science benefited from Trump in that people were looking to get out of that system and did not have confidence in it long term. Some people came over here from the States. Now with what Biden is doing, the opposite gravitational pull could potentially come into effect.

Britain obviously cannot match pound for pound what China and America are spending, but I go back to my chart earlier on. Almost all of what they are spending is in this red circle. If Britain decides to do things differently, it could have very dramatic improvements. This is not my theory. This is demonstrated historically. We know that if you do it differently you can capture these great returns. We should be looking to spend proportionately at least as much money as the countries that are most aggressive about this on the face of the planet. We should also be more aggressive than them in terms of attacking bureaucracy and trying new ideas.

Q224 **Mark Logan:** Dominic, thank you very much for coming in this morning. My questions are quite broad and linked to what Becky has just asked. We had the Integrated Review yesterday. Our aim is to secure our status as a science and tech superpower by 2030. Currently, do you feel that we are an S&T superpower? How will ARIA and the Integrated Review help us in cementing that position?

**Dominic Cummings:** It is obviously patchy. There are some fields in which we are a superpower. The first thing that comes to mind is what has happened recently with genetic sequencing of Covid variants and things like that. We have very strong life sciences, with people like John Bell at Oxford. There are areas where British researchers are doing world-class stuff. I was left in no doubt in my 18 months in Government, from talking to these people, that there is a feeling that we are falling behind overall globally. I also think that is the case.

We definitely have great universities like Oxford and Cambridge. Increasingly, the Nobel prizes of the past are being used for branding. We have not invested over the last 20 years in the way that we should have done to make sure that the pipeline of these things is continuing. It is certainly the case that our best researchers are very worried about this. They expressed this concern to me, and I was certainly very concerned about it. We have some brilliant things and we should reinforce them, but

I think the true situation is more worrying and dangerous than it appears. That is probably how I would summarise it.

Q225 **Mark Logan:** Just to come in on that, I know you have mentioned east Asia and China. I am reminded of the sci-fi novelist Liu Cixin, who wrote "The Three-Body Problem". He was asked where he got all his great ideas from for science fiction and he said that he realised that by living in China he was living in the future. Do you feel that we have anything to learn from China or, indeed, any other countries in the region?

Also, just recently I note that the Government have made a step change on industrial strategy. I am just thinking of some of the stuff you were saying about short-termism versus long-termism. I am interested in your thoughts on that.

**Dominic Cummings:** Yes, I think that we do have huge amounts to learn from east Asia. After I was at the Department for Education 10 years ago, one thing I wrote about that experience was how parochial it was as an institution, and how unwilling it was to look to learn, and, in particular, how unwilling it was to try to learn from east Asia. I think you saw exactly the same problem in Whitehall last year in a whole range of subjects.

What China and other countries are doing about making science and technology core to their policy is not the way that Britain has thought about it for about the last 50 years, which is as a kind of add-on. It is what the boffins do in white coats, but it is certainly not what serious politicians think about or what the top mandarins in the Cabinet Office think about. I think that mindset has been amazingly damaging for the country. It means that we have not funded things properly and we have not taken seriously things we should have taken seriously.

I hope that one of the lessons of 2020 is to change course from that. If you look at the President of China, he sits down for days on end with senior management around him and has sessions on things like funding edge-of-the-art science and technology programmes for the long term. If we do not pay attention to that, we will suffer enormously.

Also, China and Russia have had extremely aggressive operations against this country to acquire British knowledge, both legally and illegally, overtly and covertly, because these countries take it deadly seriously. Cameron and Osborne did not take it deadly seriously, and in all sorts of ways they left the country open and vulnerable. That is one of the many areas in which I think science and technology policy must change.

Q226 **Mark Logan:** Just briefly on the industrial strategy, what would be your views in terms of that buttressing of our science and tech prowess?

**Dominic Cummings:** I think there is a critical distinction to make. The state should not be in the business of trying to figure out whether Bill Gates or Steve Jobs is right, and whether we should support Microsoft or Apple in terms of consumer products. I think going back to the future with an industrial policy of that kind would be a huge mistake. In 2020, I

spent far more time talking about industrial policy and the productivity challenges than I did about all political and communications issues put together.

I think that should become a core element of what No. 10 is doing. We have to think across the whole pipeline, from funding core basic pure research stuff, through to applied research, missions, moonshots, that sort of stuff, through to the overall productivity challenges—skills, planning law, high-skilled immigration, all these things.

I did not have anything to do with PMQs, but, while they were going on, I used to have a separate set of meetings called Project Speed for much of 2020. We would get some of the great officials around Whitehall from different Departments and pull them together to try to figure out how to do this sort of thing. I hope that is still going on. There are certainly a huge number of very creative ideas. Rishi was a great supporter and put the institutional weight of the Treasury behind doing it. I hope a lot of that work will come out over the next few months.

**Q227 Graham Stringer:** Thank you very much, Dominic. It has been a fascinating hour and a half. I suppose it is a bit of an open goal. About 90% of scientists voted to remain in the EU. One of the reasons they gave was that the EU sponsored co-operation between different scientific institutions and universities within the EU. It was my feeling in debate and from talking to scientists that co-operation and hitting that metric became more important than the science as regards those projects. Do you agree?

**Dominic Cummings:** Yes, I do, unsurprisingly. Obviously, in the referendum one thing you and I argued very strongly was that it would be very dangerous to let the EU continue to regulate science and technology in this country, and that we should take back control of regulation over science and technology procurement. Again, I would argue very strongly that 2020 was proof that that argument was correct.

I can understand completely the view of many scientists who wanted to maintain co-operation across European networks. I think that is obviously correct, but, as things have been proved every day now, scientists can co-operate globally without having to be part of the nightmarish Brussels system, which has blown up so disastrously over vaccines. Just this week we have seen what happens when you have an anti-science, anti-entrepreneurial, anti-technology culture in Brussels married with its appalling bureaucracy, in its insane decisions over warnings on the AstraZeneca vaccine. I think we are extremely well out of that system.

**Q228 Chair:** Just a couple of final questions from me. The Integrated Review was published yesterday. It has a very strong role for science. In fact, it is the first pillar to sustaining strategic advantage through science and technology. I think those of us on this Committee would welcome that. Is there a danger, though, that this could fall into the double-counting trap. If you have this target of 2.4%, £22 billion, existing work, whether it is in the MoD or elsewhere, is declared to be science funding, and it does not

come anywhere near boosting the overall budget for universities and research institutes.

**Dominic Cummings:** Yes, I think it is great that science and technology is core to the plan for the future in defence and security in terms of reforming the MoD. I worked a lot with Angela, the chief scientific adviser there. She is fantastic, and I think she will use that money incredibly well. There is potentially a danger about double-counting accountancy gimmicks, but in the end that responsibility is going to rely on No. 10, and how much it is going to prioritise science and technology in the future. As I stressed, Rishi was always extremely supportive of me in these arguments across Whitehall, as Chancellor. I am sure he has not changed his mind, and he will continue to be very supportive, but, yes, there is a danger.

Also, of course, the MoD has a roughly £10 million black hole in its budget because of decisions made with Cameron and Osborne back in the 2010 and 2015 reviews, which were disastrous. Part of the reason we have had to put more money in the way we have done is to try for the first time in probably 30 years to have honest accounting. The new Cabinet Secretary did a brilliant job last year. I spent many hours with him round the Cabinet table with a small group of people from the MoD. They said themselves that for the first time since the end of the cold war we have got honest numbers on the table between the MoD, the Treasury, No. 10 and the Cabinet Office. There are proper figures. I know that there are proper figures on spreadsheets that exist. I hope that those are the figures that are actually being used and that it does not slide back into its old ways.

Q229 **Chair:** That leads me to my final question. You say you hope. It is clear that one of your ambitions and motivations was to make or reinforce Britain's position as a science superpower. You had a position in No. 10 to be able to do that. Did you consider whether it was necessary for you to leave? Do you regret the fact that you are no longer able to steer that personally?

**Dominic Cummings:** No, I do not regret it. I think I made the right decision to resign when I did. I actually said to the Prime Minister back in July that I would leave by Friday 18 December at the latest, so the whole thing was not exactly as it appeared.

As I said earlier on, I would be very happy to come back and answer any and all of your questions about how No. 10 works, why I left, all the different things, the crazy stories that have been in the media. I would be happy to clarify all of those whenever you guys want me to come back and talk about that.

Q230 **Chair:** Thank you very much. I think we have covered a lot of ground today, on ARIA specifically and the structure of science funding, which is the subject of the Committee's inquiry. We are very grateful for your evidence on that. It will help inform the debate and scrutiny in the House of Commons as we consider the Bill to establish ARIA.

We have, as you say, a joint inquiry with the Health and Social Care Committee into the lessons that we can learn and apply from the handling of the pandemic. We look forward to seeing you back to answer some more questions on those subjects at that time. Thank you very much indeed for your evidence today. That concludes this segment of the hearing. We are going to suspend briefly to invite the Secretary of State to join us.

**Dominic Cummings:** Thank you very much and thank you for everyone's attention and efforts to try to help the science and technology agenda.

## Examination of witnesses

Witnesses: Rt Hon Kwasi Kwarteng MP and Jo Shanmugalingam.

Q231 **Chair:** The Committee is back in session. We are continuing our inquiry into science policy science funding, and, in particular, the new ARIA research agency. I am very pleased to welcome for their first appearances before this Committee the Secretary of State for Business, Energy and Industrial Strategy, Kwasi Kwarteng, and Jo Shanmugalingam, who is the director general responsible for science at the Department for Business, Energy and Industrial Strategy. Thank you very much indeed for joining us today.

**Kwasi Kwarteng:** Thank you.

Q232 **Chair:** I will start with some questions about science policy and science funding. Do the Government stand by the commitments made in the manifesto, the Queen's Speech and other fora to the 2.4% target for R&D spending by 2027 and £22 billion of public funding for science by 2024-25?

**Kwasi Kwarteng:** Absolutely, we remain totally committed to those targets, Chair.

Q233 **Chair:** As regards deploying that and making sure that the institutions have the money to spend, has the budget for UKRI, which is the main research funding organisation, been set yet for the next financial year?

**Kwasi Kwarteng:** It is still being discussed with Treasury and also with BEIS. There are a number of pressures, as you will appreciate, on the budget given where we are with Covid. We are still in those negotiations and that conversation.

Q234 **Chair:** But it is two weeks until the beginning of the next financial year.

**Kwasi Kwarteng:** I am fully conscious of when the next financial year starts, Mr Clark, and we are very keen to get some sort of resolution pretty soon.

Q235 **Chair:** We know you picked up the portfolio in January, and there is a lot to do for the reasons you say, but you will understand that it is a very unhappy situation for an agency that makes long-term commitments not

to know its budget two weeks before the financial year starts.

**Kwasi Kwarteng:** It is very difficult, but you will also appreciate that, after £407 billion has been committed to the economy over the course of the last year, there is an unprecedented pressure on budgets, and we are in the process of trying to get a good settlement for UKRI.

Q236 **Chair:** When do you think those conversations will conclude?

**Kwasi Kwarteng:** Certainly before the start of the next financial year.

Q237 **Chair:** So in the next couple of weeks.

**Kwasi Kwarteng:** Absolutely.

Q238 **Chair:** Just give us a bit of background. What is the reason for the delay? Is it because money is being spent on other things or are there other factors?

**Kwasi Kwarteng:** You will appreciate there is a whole range of things that we have tried to button down. There is the Horizon issue, which I am sure you will revert back to in your questioning. There is a whole range of issues relating to the Covid pandemic that were announced in the Budget, and that will have an impact on public finances. Also, we are introducing the ARIA Bill, which is separate, as I am sure Mr Cummings pointed out. That is part of the wider discussion as well.

Q239 **Dawn Butler:** Thank you, Secretary of State. We have just heard from Dominic Cummings and I want to talk a little about UKRI. It was formed in 2018. It has barely got off the ground. It was kind of made clear that there is a problem with the process when it comes to funding science. Is it wise to prioritise a new agency rather than making UKRI more flexible, with a visionary, high-risk, high pay-off science division?

**Kwasi Kwarteng:** I think Mr Cummings made a good answer to that point. What ARIA is trying to do is fundamentally different from what UKRI is set up to do. They are different types of organisation. Even though there is an overlap, fundamentally they do different things. ARIA is about agility and nimbleness and has a higher risk appetite, as Dominic Cummings suggested. UKRI is the main funding body of our academic research. It does a great job. I think Sir Paul Nurse's review of 2015 really set out the vision for UKRI. The whole point of it was that it had a cross-research view. ARIA does not have that. ARIA is a different beast and should be thought of in a totally different way.

Q240 **Dawn Butler:** I totally understand that, and I can in some respects see the need for ARIA, but what I am saying is that in the Bill it does not seem to make any connection to UKRI, and that seems quite strange seeing as it is the UK's fundamental scientific research arm.

**Kwasi Kwarteng:** I do not think it is strange at all. I have the Bill in front of me. You will appreciate that a lot of this legislation has to be as concise as possible. It is a stand-alone Bill and it is a stand-alone independent entity. It would not make any sense to refer to UKRI explicitly in the Bill that was designed to set up ARIA.

Q241 **Dawn Butler:** ARIA is exempt from freedom of information requests and will be able to spend taxpayers' cash in any way that it likes. Do you think that may raise alarm bells for some people with the recent PPE scandals?

**Kwasi Kwarteng:** I think you raise a fair point, but you have referred to the Bill, and I will refer back to it. If you look at the Bill, schedule 1 has a number of sub-clauses that deal explicitly with the corporate governance arrangements of ARIA. I think they are very robust. I as the Secretary of State or my successor will have to report to Parliament on ARIA. There is a duty on the part of ARIA to submit accounts. These will also be scrutinised by Parliament. I reject any idea that this is somehow going to be outside the normal corporate governance structure. I think there will be a great deal of transparency and oversight.

**Jo Shanmugalingam:** You are exactly right that through the Bill we are setting up this new research funding agency, and we will come back more to the purposes of that, but, at the same time, we are absolutely continuing to support and develop UKRI. We appointed an excellent new chief executive last summer and they have been doing great work since then on reducing the bureaucracy of the funding system.

As we set out in the R&D road map last summer, shortly, we will be commencing an independent review of bureaucracy across the whole funding system—universities, research funding agencies and all the other actors—to make sure that this is not just about concentrating on ARIA but that we make the best of the whole funding system, of which UKRI will always be the critical engine and core of the system.

Q242 **Dawn Butler:** Thank you. That adds clarity. In order for ARIA to exist, it needs to be outside of the bureaucracy, and it needs to have the freedom, but it also needs to have some transparency around that.

If it is going to be scientists who are on the very edge, the cutting edge, of scientific development, is the Secretary of State really the right person to lead ARIA? How would the Secretary of State know exactly what is happening, because this would be cutting-edge technology and you would need to be deep into it to understand it? Also, how would we be able to monitor it if, say, ARIA was to do research on eugenics?

**Kwasi Kwarteng:** Forgive me, there are two issues here. There is the actual leader of ARIA, who is independent. We are going to be recruiting them, and he or she, whoever it is, I am sure, will be an excellent leader of the organisation. Then there is of course the parliamentary and governance oversight, where the Secretary of State necessarily has a role. He or she, after all, will be the person summoned to Committees like this to explain what ARIA is doing.

So there are two issues. There is the governance role, where the Secretary of State has a key role to play, but the Secretary of State will not be determining on a day-to-day basis what the missions of ARIA will be, nor will the Secretary of State be funnelling money, if that is a way of describing it, to individual projects. There is a separation of the operation

of ARIA, which will be run by a director, and the governance responsibility to the House of Commons, to Parliament.

Q243 **Carol Monaghan:** I will ask you questions about UKRI in just a second, but, first, Secretary of State, how will the Government ensure there is oversight to make sure that ARIA is fully representative of the devolved nations as regards funding allocation?

**Kwasi Kwarteng:** I think you raise an excellent point. Obviously, in setting up this new body we wanted to reflect the wide talent and geographical spread of the United Kingdom. Certainly from my point of view, there is absolutely going to be a real interest in making sure that that is represented.

I have referred to schedule 1 of the Bill. There are specific things where the Secretary of State is involved in appointing perhaps non-executive members of the board and governance, and that is an area, even though it is not expressed in the Bill, where I think we can do a much better job than we have done traditionally in representing the full breadth and width of the United Kingdom.

Q244 **Carol Monaghan:** Thank you, because a concern that is raised regularly with me and others is the spread of funding and how it is still concentrated in London and the south-east.

I will move on to the spending review. The announcement of £14.6 billion for R&D for 2021-22 was welcome. Will this include the contribution for Horizon Europe, or will that be considered as separate funding?

**Kwasi Kwarteng:** That is a subject of the conversations that I was referring to your Chair. We will have further conversations, further debate if you like, within Government, but it will be concluded very soon. Jo, do you want to add anything on that?

**Jo Shanmugalingam:** Obviously, the very welcome decision to associate to Horizon Europe happened after the spending review and, therefore, was not part of those spending allocations. As the Secretary of State said, discussions continue about how our association to Horizon Europe is funded.

Q245 **Carol Monaghan:** I take it that you will alert the Committee whenever you find that information out, or when a decision is made.

**Kwasi Kwarteng:** Absolutely. It is absolutely right that your Committee gets very early sight of when things are decided and what is happening.

Q246 **Carol Monaghan:** Thank you. Looking at Horizon Europe, Secretary of State, I understand that you are aware that there have been moves to exclude associated members from certain quantum and space funding streams. What actions are you taking to ensure that these remain within the funding model from Horizon?

**Kwasi Kwarteng:** We have tried very hard and we are still trying to make sure that this funding is protected. I think that we will make some

progress in this area and I am hopeful that, essentially, we can be members of Horizon on the basis that we have historically been.

Q247 **Carol Monaghan:** Finally, there is the news that UKRI has had a reduction in ODA funding. This is a necessary part of global co-operation, and we have all been very interested in global co-operation in the last year. UKRI has said this will lead to a £120 million gap between allocations and commitments. Is this also going to impact non-ODA funded work?

**Kwasi Kwarteng:** As I said, we will have to wait and see where the negotiations come to. In terms of the ODA reductions, we have said these are very difficult decisions to make, but the Chancellor made a decision to reduce ODA commitment from 0.7% of GDP to 0.5% of GDP. He made very explicitly the case that this was an exceptional policy and that we will revert to 0.7% as soon as the fiscal situation permits. Those were almost the exact words printed yesterday in the Integrated Review, where we made a very clear commitment, I think on page 5, to getting back to 0.7% as soon as the fiscal situation will allow.

Q248 **Carol Monaghan:** I think what is causing concern is the phrase “whenever the fiscal situation allows.” That could be any time really. Is there any move from UKRI, or will there be any move from Government to replace the UKRI funding that has been lost as a result of this?

**Kwasi Kwarteng:** We remain absolutely committed, Ms Monaghan, to the 2.4% target that your Chair referred to by 2027. We are absolutely committed to spending enough to make sure that we are a science superpower. That remains a robust commitment that I can reinforce today.

Q249 **Rebecca Long Bailey:** Thank you both for joining us today. Secretary of State, you have heard that there is a confirmed £120 million shortfall for research funded from the ODA budget. Yesterday, following the Integrated Review, Universities UK, as I am sure you will be aware, wrote to the Government stating that universities are increasingly alarmed by reports that the Treasury has not made funding available to support the UK’s association to Horizon. It says that if this position is maintained it will amount to an effective cut in excess of £1 billion, equivalent to the loss of over 18,000 full-time academic research posts. Are the cuts in ODA funding for science and the potential requirement for UKRI—and I know you have not stated what is going to happen yet—to fund Horizon from existing budgets really consistent with the Government’s aims to increase funding for research?

**Kwasi Kwarteng:** I think you make a fair point. I have said this a number of times. There is a huge pressure on public finances. We have a very ambitious commitment as far as the science superpower agenda is concerned, yet, today, we are in very straitened circumstances. There has been a huge demand on the public finances. The Treasury has put, as I said, £407 billion into the economy in the past year, and we have had to reduce the proportion of GDP that we put in for ODA money, and that has an effect, clearly. My job as Secretary of State is to try to make the

case for science funding. That is what I am doing. That is why, as your Chair suggested, we are engaged in ongoing talks within the Government.

Q250 **Rebecca Long Bailey:** You have reaffirmed the commitment of 2.4% of GDP on R&D, but there is a real possibility that the cuts that are referred to could be masked by the 2.4% simply being met by a collapse in Britain's GDP since the pandemic started rather than real-terms increases in funding. Will you be altering this percentage to account for this fall in GDP?

**Kwasi Kwarteng:** There are a lot of assumptions behind your question. I do not think the quantum of GDP will be lower in 2027 than it is today. That is predicting an appalling collapse of the economy. I think the economy will grow. In fact, the OBR in the Budget suggested that the economy will be growing every year from now until 2027, and I expect that the 2.4% will be considerably more in real terms as well as nominal terms than it is today.

Q251 **Rebecca Long Bailey:** Finally, on medical research, a number of medical research charities have warned of the significant impact of Covid-19 on their budgets for funding research. Responding to the recent Budget, the Association of Medical Research Charities said that the Government had chosen yet again not to provide any clear support for charity-funded medical research in the Budget. How do the Government intend to support medical research going forward to address the shortfalls that charities are currently facing?

**Kwasi Kwarteng:** Again, that is a very fair point to raise. Only last week I spoke to Michelle Mitchell, the chief executive of Cancer Research UK, and Michelle was very clear with me that there has to be some sort of settlement. There has to be some degree to which the Government are prepared to meet the shortfall of medical research charities and fund the difference. Obviously, that is a difficult conversation to have, but we are looking at ways of engaging with her and her colleagues in other charities to make sure that we can provide the support. They are under a lot of pressure. As you know, a lot of their private donors, individuals who are very generous, have also been squeezed, and that is why we are in the difficult position we are in.

Q252 **Chris Clarkson:** Thank you for coming today, Secretary of State. Later today we are going to be debating both the breaking up of the Union and Brexit, so I thought I would take the opportunity to ask about the Shared Prosperity Fund. First, could you tell us when that is likely to be announced?

**Kwasi Kwarteng:** My understanding is that will be announced later this year. As you know, it has been the subject of ongoing discussion. I certainly remember talking about the UK Shared Prosperity Fund when I was PPS to Philip Hammond when he was Chancellor. It has been ongoing and clearly, now we have a deal, we can accelerate this work. We hope at the end of this year to have much greater clarity as to the quantum of the fund and perhaps as to how it will be distributed.

Q253 **Chris Clarkson:** Will part of that fund be explicitly allocated for research and innovation?

**Kwasi Kwarteng:** The way the fund works will be specifically centred around place, so it will be centred around the geographies of the UK. As far as I know, there has not been an explicit allocation to R&D, but, clearly, we have to work out what the quantum of the fund is before we can put labels on to which needs the funding will meet. R&D is clearly very close to what the Government are trying to do, but I am not sure what the role of the UK Shared Prosperity Fund will be in that context. I am sure Jo will be able to shed light on that.

**Jo Shanmugalingam:** The spending review in November last year set out the main strategic elements of the future UK SPF and, as the Secretary of State said, later this year an investment framework will be published. We expect the multi-year spending profile to be confirmed at the comprehensive spending review. We also have the UK Community Renewal Fund, which through its one-year pilots will help to inform. We are very conscious of the role that the predecessor funds have played in combining with some of the national research funding we provide to support research and innovation in particular locations. Those are the discussions that will happen in Government through the course of this year.

**Kwasi Kwarteng:** To add to that, I think Jo makes a very good point that the R&D offer has come through previous funds as well. How the UK SPF fits into that is still, I think, a matter of discussion.

Q254 **Chris Clarkson:** Very quickly picking up on that because Jo mentioned multi-year settlements, will there be provision for long-term funding like the EU structural investment funds did previously?

**Jo Shanmugalingam:** I am sure that is something that the Treasury will be considering as part of the comprehensive spending review. I do not think we can speak for it here today, I am afraid.

Q255 **Chair:** Thank you for that. We will turn to talk about ARIA and some of the questions around the Bill, if we may. Just to reflect on what we have heard so far on science funding, I may be wrong, but I get the impression that the discussions are continuing, there is a difficult fiscal settlement, and the fact that they are continuing suggests to me that you are in a series of conversations and you are advocating for this.

**Kwasi Kwarteng:** Sure.

Q256 **Chair:** Would you accept that given the commitment that you have reiterated to a doubling of the science budget, and to an overall investment in R&D that is to reach 2.4% by 2027, it would be paradoxical, and regrettable, if there were to be a shrinkage in the science budget in the next couple of years?

**Kwasi Kwarteng:** As far as I am concerned as Secretary of State for BEIS, I want us to honour our commitments and lead the way as a science superpower. You will appreciate from your days as Financial

Secretary to the Treasury—so you know what the process is like—that there is a huge amount of debate. People will debate how you define the R&D spending. All Governments have always had these discussions between different Departments. The broad commitment remains the same, and I see a key part of my job as Secretary of State to make sure that we hit those targets.

Q257 **Chair:** As regards the short term as well as the long term, may I confirm what I anticipate is the case, that you are aware of the consequences, and what would be bad consequences for organisations like the Faraday Institute? It was established to develop cutting-edge technology in batteries, and we know that is going to be important in the future. Because its funding is not confirmed, it is going to have to start to wind down its activities, just at the point when we need to expand them. As an example of something for which a delay would have severe consequences, are you batting for it?

**Kwasi Kwarteng:** Of course. I am completely aware of the risks, the liabilities, if you like, as regards our funding situation. There are a number of great projects. You mentioned the Faraday Institute, and the Faraday challenge is a great project. Clearly, we are in a world where we are cash constrained or budget constrained, and a lot of great projects may be exposed. Our job is to protect them and make sure that the quantum, the rate of change, the increase, is sufficient to make sure that these things thrive and grow, and that is part of my job.

Q258 **Chair:** In the same vein—and it is not to lay it at your feet personally because, as you have made very clear, there is a conversation across Government about this—on the ODA and whether that is made up, this week the UKRI have had to make an announcement that there is a £120 million gap between allocations and commitments. These are projects that have already been scrutinised, approved and found to be good value for money and impactful. The UKRI, a Government arm's length agency, has said that it is unavoidable that some grants will need to be terminated. Can I take it that you are battling to avoid that having to be put into effect?

**Kwasi Kwarteng:** Sure. We are always making the case and representing as passionately and energetically as we can the interests of our science base, but there is a wider context here. We are committed to trying to reduce by £5 billion the overspend, and that will have consequences. This is in the context of an unprecedented fiscal situation. You will remember from your Treasury days that there was not a single time in those years where we were spending £407 billion, as we have done, to keep the economy going.

It means there are very difficult choices. The Government—the Prime Minister and the Chancellor—have had the courage to make those choices, but some of them have had impacts, and in some of our research spending, particularly with the ODA money, some difficult choices have been made.

Q259 **Chair:** I have a final question before I turn to Graham Stringer on ARIA. I do not know if you heard any of the evidence of Dominic Cummings.

**Kwasi Kwarteng:** I heard it in patches.

Q260 **Chair:** He was making the case that support from the centre at No. 10 and the Treasury was very important to advance your ambitions. He was very complimentary about officials in BEIS in this regard. Do you have the same level of enthusiasm and commitment in No. 10, and perhaps this is one for Jo, as she is there? Perhaps I can talk about the circumstances of your appointment. Was this something in the Prime Minister's mind? Did he emphasise the importance of science and delivering on the commitment?

**Kwasi Kwarteng:** Absolutely. We can talk about my appointment. I was Minister for Energy for 18 months. I was not an unknown quantity within BEIS. During that time, obviously, when you were Secretary of State we passed the net zero Act, and we had the 10-point plan and the Energy White Paper. What the Prime Minister expressly said to me is, "You have come from within BEIS, and we need to really up our game, not only on net zero, but we need to think about what we are doing on innovation and other areas of the portfolio."

In the first week I was there, I commissioned an innovation strategy and I am very delighted that Jo is the director general who is driving that. She is doing a great job, and the officials within BEIS, as you will remember, are second to none across Whitehall. It is a very good Department to be Secretary of State for, as I am sure you will remember.

**Chair:** Absolutely.

**Kwasi Kwarteng:** Jo can perhaps fill you in on that.

Q261 **Chair:** I do not want to put you in an invidious position because you obviously have to work with colleagues across Whitehall, but can I take it that you are still effectively engaged as a Department with No. 10 even given the personnel changes that have happened there during your tenure, if not the Secretary of State's as Secretary of State?

**Jo Shanmugalingam:** Absolutely, I think the Prime Minister's personal commitment to science innovation and technology is completely clear to everyone in Government. You saw it yesterday in the launch of the Integrated Review and how central science and technology is to that. We continue to work really closely with No. 10 and we absolutely feel their support loud and clear for what we are trying to do in the Department.

Q262 **Chair:** Are you part of the discussions that Dominic Cummings mentioned that the Prime Minister has approved to create in the centre, in the Cabinet Office, a strong science cross-government team capability?

**Jo Shanmugalingam:** The Secretary of State is the Secretary of State for Science and Innovation. That is very clear. We are always working with our colleagues across Whitehall on how we make sure we deliver on the Integrated Review and the role the Cabinet Office can play in bringing

together all the different bits of Government. In BEIS we are responsible for the science system, as you know, and particular elements—fusion research, net zero. What the MoD and the DHSC do, and what all the other Departments do, is really important. The Cabinet Office has a really strong role of bringing it all together to be more than the sum of its parts.

Q263 **Chair:** Indeed, and Mr Cummings said that, because it is spread across Whitehall, the Prime Minister had commissioned the Cabinet Secretary to create this Cabinet Office team. Is that under way? Is that being created?

**Jo Shanmugalingam:** I am not going to speak for the Prime Minister and what his plans are there. We always look at how we best make sure we deliver the Prime Minister's ambitions, and they are really clear on science and technology.

**Kwasi Kwarteng:** Particularly on that, I was very clear with the Prime Minister that I wanted BEIS to take a lead on science policy. That is why I immediately commissioned the innovation strategy, which Jo is leading. That was within my first week as Secretary of State. I also said explicitly that we would own the space strategy. If you look at space and the policy around space, that was sitting in lots of different buckets. Obviously, No. 10 had a clear interest in it, as did the UK Space Agency, the MoD and other Departments. I have said that BEIS will take the lead on this. We are holding the pen on the space strategy. We are very keen and excited about delivering that in the next few months. I am sure your Committee will be very interested in that work.

Q264 **Chair:** So you are going to be a muscular force in promoting, and indeed defending, the science and related policy in buckets.

**Kwasi Kwarteng:** Absolutely. It will be a very energetic approach that we take to this.

**Chair:** Let us go into a bit more detail on ARIA, starting with Graham Stringer and then Aaron Bell.

Q265 **Graham Stringer:** Good morning, Secretary of State. It is good to see you. I have just a couple of questions in detail on the Bill. You say you have it in front of you. If you look at clause 2(6)(a), (b) and (c), can you tell the Committee why, while there is a section on the economy, innovation, and improving quality of life, there is nothing specifically on defence?

**Kwasi Kwarteng:** It is quite a short Bill; it is a succinct Bill; and, of course, as you know from your parliamentary experience, what we did not want to have is what is often called a Christmas tree-type Bill. We did not want to capture life, the universe and everything on the face of the Bill. You will also know, given your governmental and parliamentary experience, that the MoD has a specific interest in defence research. We are not trying, contrary to common belief, to re-create DARPA, which, again, as you know, is the US defence research agency. ARIA is something very different. I am sure Dominic Cummings would have

mentioned that. He would say that ARIA's inspiration was really the ARPA of the 1960s, which was not as defence focused as DARPA, and I think this is reflected on the face of the Bill, as you have mentioned.

Q266 **Graham Stringer:** In the really difficult balance in accounting for the expenditure of public money and giving scientists the freedom to innovate and think the unthinkable, I was slightly disappointed when I read the Bill, because, if you read schedule 1, effectively, it gives you as Secretary of State, or the Government, the ability to completely take control. Even if you do not use it, that is hanging over the organisation at any time. Do you think you have got the balance right, Secretary of State, in giving the necessary freedom to this body?

**Kwasi Kwarteng:** I think you are absolutely right that there is a difficult and delicate balance to strike between parliamentary oversight and some degree of control, which oversight implies, and the intellectual freedom that is so necessary to making a success of this kind of institution. Dominic Cummings spoke very eloquently, as I saw, about the intellectual freedom, the invention and the creativity that is required. As a parliamentarian you will appreciate, and certainly I do as Secretary of State, that this organisation has to have some degree of parliamentary oversight.

I think schedule 1, which you have referred to, and I have referred to in my answers, outlines very clear clauses that allow the Secretary of State to intervene should he or she have to, but also permits the organisation with its non-executive members of the board and its executive members of the board and its director to have a degree of independence. I think a good balance has been struck in the Bill.

Q267 **Graham Stringer:** Dominic Cummings talked about debureaucratising science. The largest and latest example he gave was comparing the excellent development of a vaccine and the distribution of a vaccine, which is absolutely world-class and first rate, with the procurement of PPE and the roll-out of "test and trace and isolate". Have you learnt any lessons from the comparison between those two projects that you can apply to ARIA, or science in general?

**Kwasi Kwarteng:** I think we have all learnt a huge amount from the experience of the last year. I would want to use the opportunity now to say that the vaccine roll-out was an extraordinary thing that happened. If we just reflect on what happened, and I think we should, within a year, essentially, we found this appalling illness, this appalling virus. Our scientists managed to work out how to vaccinate people. We got the vaccine; we produced the vaccine; and we distributed it to the extent of millions. Today, I think that something like 25 million of our people have been vaccinated. All of this happened within 12 months. It is an extraordinary story and we cannot dwell enough on it.

In other areas, I think lessons have been learnt, and I am sure Dominic Cummings has expressed himself on that. I think the Prime Minister and people within the Government have talked about trying to learn the

lessons. There may well be an inquiry that will take place after we have come out of this process. Clearly, there is a lot that we have learnt. I think the part that BEIS played in the vaccine roll-out—and I am very pleased and flattered that Dominic Cummings acknowledged this Department's role in that—was exemplary.

Q268 **Chair:** Thank you very much indeed. On the vaccine, the triumph, such as it has been, is a really fantastic example of science, the NHS, the Government and funding bodies working together, and is clearly something to be emulated. You will know that Sir Jeremy Farrar, the director of the Wellcome Foundation, one of the principal charitable funders, has expressed himself concerned. He is a member of SAGE. He has been a part of all these discussions. He says that as things stand the National Institute for Health Research faces a funding cut for global health funding, which is crucial to just what we have been talking about, of 28%. This goes back to what we were talking about. Have you raised with the Prime Minister the imperative of getting this sorted out?

**Kwasi Kwarteng:** I have raised with the Prime Minister a number of times the fact that we have to do two things. On the one hand we are talking the talk of a science superpower, which is great, but, fundamentally, we also have to walk the walk. I remind the Prime Minister about that constantly.

**Chair:** Fantastic.

Q269 **Aaron Bell:** Welcome, Secretary of State, and congratulations on your appointment. I want to ask you some fairly basic logistics about the setting up of ARIA. Before I do that, could I briefly touch on your Radio 4 comments this morning about the Cumbria coalmine, in which you said you were sympathetic to what the Climate Change Committee said about the negative impression this is possibly causing? Obviously, climate change is a global problem, which is why we are having COP 26. Surely the rational and scientific thing to do is to consider the world ecosystem and emissions globally in any decisions we make about this. Can you confirm that that is what your Department is doing?

**Kwasi Kwarteng:** Absolutely. All I was saying in the interview was that as Secretary of State for BEIS I work extremely closely with the Climate Change Committee. My views are very much aligned, in most instances, with its views. You will appreciate this is something that is going through a legal process, and I am not going to get drawn into the whys and wherefores and the particulars of that particular case. Generally, as Secretary of State for BEIS, one of whose key priorities is the net-zero priority, which I am very pleased to say that Mr Clark drove through as Secretary of State, we take that very seriously. As a consequence of that, I am very much closely aligned with the Climate Change Committee.

Q270 **Aaron Bell:** Understood, but I think the concern would be that we are not doing things that offshore our emissions and might increase total global emissions at the expense of making ourselves look good.

**Kwasi Kwarteng:** Absolutely. I think that is true. Also, one of the things we announced today, and I am sure you picked that up from the interview, is the decarbonisation of industry. That is clearly the prize that we are focused on. If we can achieve that, we will not need coke and coal in the UK because we will not be using that technology. That is clearly some way down the track, but that is the ultimate goal, and I think we can achieve that in 15 years.

Q271 **Aaron Bell:** Turning to ARIA, when do you intend to begin recruiting for the chair and CEO of ARIA? Will you be restricting the pool of candidates to scientists, or are you prepared to look beyond scientists?

**Kwasi Kwarteng:** We are not restricting the pool of any candidates. We are going to be starting in the early summer, probably April/May, that sort of time.

Q272 **Aaron Bell:** Will the chief exec and the chair be subject to pre-appointment hearings, presumably by this Committee?

**Kwasi Kwarteng:** I do not think they will in the first instance because they are not one of the institutions on the Order in Council that would require that. There is no reason why we cannot reach an accommodation with the Committee once the institution is up and running. Jo, do you want to come in on that?

**Jo Shanmugalingam:** No, that is correct.

Q273 **Aaron Bell:** There is no official requirement to have them.

**Kwasi Kwarteng:** It is new.

Q274 **Aaron Bell:** But I think it would be welcome if this Committee was engaged.

**Kwasi Kwarteng:** Once it is set up, I am sure we can find a way of accommodating the Committee's insatiable curiosity.

Q275 **Aaron Bell:** Will ARIA exist in shadow form for a period first? When will it be fully operational? Is there a specific date in 2022 we are looking at?

**Kwasi Kwarteng:** As I see the process, we will launch a campaign—that is the phrase we use—to find a director. I think we will have some officials as part of ARIA. Then I imagine the launch of the organisation will be some time in 2022, but these dates can shift, as we all know.

Q276 **Aaron Bell:** Will there be a shadow phase before it is launched?

**Kwasi Kwarteng:** I am not quite sure what you mean by a shadow phase.

**Jo Shanmugalingam:** That is subject to Parliament considering the legislation. We have no organisation until Parliament has considered the legislation. Our hope and expectation is that it will be fully operational in 2022. Depending on the timing of the passage of legislation, and the appointment of the chair and chief exec, we will then look at whether it makes sense to have some sort of shadow phase, as you say, as we did

with UKRI, before we enact the provisions, if Parliament passes them, for ARIA to be fully constituted.

**Aaron Bell:** It is obviously vital to get the right person, and I know Katherine is going to ask about that.

Q277 **Chair:** Just on the shadow organisation, my understanding, and perhaps you know better, is that after the Second Reading you can establish a shadow organisation, so you can get under way rather than waiting for the length of the parliamentary process. Is it the intention to make use of that ability?

**Jo Shanmugalingam:** I think what we will want to do first, as the Secretary of State says, is make sure we have identified the right chair and chief executive for this organisation. That is the priority alongside the passage of the legislation.

**Kwasi Kwarteng:** We have to jump the fences as they come.

Q278 **Chair:** So you will get on with that.

**Kwasi Kwarteng:** Once we have identified and hired and signed the deal, as it were, on a director, the other elements can fall into place, and we can deal with those problems as they arise.

**Jo Shanmugalingam:** As the Committee's report rightly says, the culture of the organisation and the organisational structure are key. We need the chair and a chief executive to be directing that and setting that. I do not think it makes sense for us to get too far ahead until we have found those individuals who are going to shape this organisation.

**Aaron Bell:** I was going to say that the people at the very top are so important, and we would not want to be in a situation where we miss out on somebody because of the process and the order in which that takes place. I think my time is nearly up and Katherine Fletcher is going to follow up.

Q279 **Katherine Fletcher:** When we were talking to Dominic Cummings earlier, I was really keen to understand how we do not make it impossible for any normal human being to do the job. A person who can spread a breadth from quantum mechanics to net-zero technologies to the completely brand new, which, frankly, nobody in this room is qualified to understand, is a hell of an individual. What qualities do you want the ARIA leadership to have, apart from being superman or superwoman?

**Kwasi Kwarteng:** I think the whole superman or superwoman thing is a red herring. Obviously, we want somebody with drive and curiosity, and also organisational ability, because it will be a very unusual organisation. I can tell you, Katherine, that we have already had a lot of interest in ARIA, not just from countries that wish to reproduce it, and are very interested in what we are doing, but also from individuals, as I understand, who are very interested in the potential for actually heading and leading an organisation that is so innovative and unusual. I think there is a huge amount of interest.

I am very confident that at the end of the campaign we will hire someone with the requisite skills: as I say, a passion for innovation, a flexibility of mind, energy—all these qualities. They do not have to know everything about everything, but I am sure we can find someone who has the requisite skills to drive the project forward.

Q280 **Katherine Fletcher:** As to culture, you mentioned leadership, and, ultimately, any system that is relying on people is about culture and leadership at the end of it. Are you going to hire someone who is going to create a skunkworks, off-the-wall collaborative culture, or are you looking for someone who is capable of effectively administering others to do that in the CEO and chair roles?

**Kwasi Kwarteng:** There is no reason why people cannot do a bit of both. There are lots of examples. I have been very lucky in my current role in this job to speak to people like Demis Hassabis. He is a great innovator. He headed up DeepMind. He has people skills and leadership qualities, but he is also an innovative and creative thinker. There are lots of people out there who really have an appetite to do this kind of work. I am very hopeful that we can recruit someone in that mould.

**Katherine Fletcher:** Fair enough. Thank you, Secretary of State.

Q281 **Chair:** Did you want to add anything to that, Jo?

**Jo Shanmugalingam:** Just to say, it is a great question. We are making different appointments here. We are appointing the chair and we will be appointing the non-executives in future, and then we appoint the first CEO. We will want different skills in those people, particularly the chief executive and chair. One of the balances we have tried to strike in the legislation in schedule 1, which we have talked about, as well as giving ARIA the operational freedom it absolutely needs, is having the good governance. There is a board with a majority of non-execs, accounts and an annual report to be laid before Parliament. The skills of the person to lead the board will be different from the skills of the chief executive, who is going to create and drive the culture, and identify and lead the programme managers, which is where the domain-specific expertise will really be vital.

Q282 **Katherine Fletcher:** I have one brief follow-up. What Dominic Cummings was talking about was that, if it gets too close to conventional structures, it is going to fail. Listening to that, with non-execs and permanent roles, that sounds quite like existing cultures. We heard lots from US DARPA about the fact that it is temporary. Everybody has an end date on their passes to make sure that they do not get too comfortable. Is that going to be part of this model?

**Kwasi Kwarteng:** Katherine, you have identified the key problem that we have been talking about. We have to balance, on the one hand, something that is new, innovative and creative, and slightly wacky perhaps and unconventional, and, on the other hand, we have to have corporate governance. I am responsible to people like you, frankly, and Parliament, as I should be, to justify the actions of this project, of this

organisation. We do have to have corporate governance structures, which are very clearly outlined in schedule 1 of the Bill, but at the same time we want to create something new and fresh and innovative. It is a balance that I think Graham Stringer referred to. I think the balance is about right. Clearly, if I do not get it right, I will be up here answering questions in front of Mr Clark and yourselves.

Q283 **Chair:** I have a couple of final questions. One of the big questions in our report and in what we have heard today, and in the commentary since the Bill was published, is what the focus is going to be. Take us into your confidence on that. What are your thoughts on that?

**Kwasi Kwarteng:** I think that is a very fair question. If I were in your position, I would be asking what the core missions of ARIA are. I think that is a legitimate question. I think the point that Dominic Cummings made, or I am sure would have made, is that that will be a job for the people we hire who are running the organisation.

Just to give you a flavour, I am very keen that we have an innovation strategy. That innovation strategy will be following up on your Grand Challenges, and I am sure we will be refining those. That will provide what I call tramlines. It will be up to the head of ARIA to decide whether he or she thinks the organisation should adopt what the innovation strategy suggests, or adapt it, or reject it. They will have independence, but I think there is a role for Government to stress or outline tramlines, as I call them, as to where we think the UK has comparative advantage and what areas we want to see dynamic innovation in.

Q284 **Chair:** So you will publish the innovation strategy, and the people, or person, running ARIA will consider that. Will it be up to them to decide?

**Kwasi Kwarteng:** I think ultimately it will be up to them, but I look forward to having that conversation when it is up and running.

Q285 **Chair:** Finally, you probably heard some of the reflections partly to do with the need for ARIA being a reflection on the levels of bureaucracy and delay in the current research structure. You have inherited this. What are your first impressions? Does it conform to what Dominic Cummings was saying?

**Kwasi Kwarteng:** Dominic has his own particular take on things. I do not see UKRI as being mired in bureaucracy and red tape. I think for what it is and what it does, it is very effective. The way I look at it is that ARIA and UKRI are trying to do different things. You cannot judge them on the same criteria. They are different beasts, if you like. I think UKRI works effectively. As the main channel of science and research funding in the UK, and particularly in academia, it works very well.

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 of institutions, as they do in the

United States. I think ARIA is a step towards greater diversity in terms of our approach to R&D.

Q286 **Chair:** The Committee, as you know, has endorsed the proposal, but the concern might be that that is thought to satisfy the appetite for reform when the great majority, I think 98%, of science funding will be through other organisations. Even in UKRI, people who have given evidence to the Committee from UKRI, including people who have led UKRI in the past, have been very critical about some of the bureaucracy that they feel was imposed on them. Do you have a reform agenda?

**Kwasi Kwarteng:** As Jo mentioned earlier in her excellent answers, we are going down a review of bureaucracy precisely to try to cut away some of the red tape that people have complained about. All I was trying to say is that I think UKRI does a good job. I do not see it as the bureaucratic nightmare that others have portrayed. I think it has been effective. You just need to look at, as I said, the vaccine roll-out. But that does not mean that bureaucracy is not a problem, or that it is utterly perfect, and it does not mean that we cannot do more to try to tackle bureaucracy.

Jo, do you want to come in on the review?

**Jo Shanmugalingam:** As we said, we will be launching the review announced in the R&D road map to look at the whole system. It is not just UKRI's role or that of other research funding agencies. It is how it interacts with what goes on in higher education institutes and other places where research happens.

The other thing I would observe is that UKRI is still a really young organisation. Ottoline Leyser and I were giving evidence to the Public Accounts Committee a couple of weeks ago about the Industrial Strategy Challenge Fund and exploring there how UKRI is developing in its capability to do business cases and set out the monitoring and evaluation of projects, so that we all, rightly, can evaluate the impact of the research that it funds and therefore the public money we are putting into it, and make sure that, as UKRI matures as an organisation, this all works more smoothly as well.

Q287 **Chair:** When do you expect to conclude that review of the bureaucracy?

**Jo Shanmugalingam:** We are expecting it to conclude at the start of next year. These are system-wide issues and we want to look at them deeply and thoroughly. It is a generational reform we hope to take through as a result of looking at the issues.

Q288 **Chair:** I think that concludes our questions today. Thank you very much indeed for your time. We have gained a lot of insights that will help, I hope, both Houses of Parliament to scrutinise the ARIA Bill when it goes on the Floor of the House and into Committee. You have addressed some of the very live and urgent questions of science funding. We have a clear view as to your muscular intention on that.

We wish you well and we hope that you will be able to come back to the Committee very soon with some positive news. In particular, in the

context of a very welcome rising science budget, it would be totally counterproductive to find any shrinkage of that in the shorter term. Thank you for your evidence today, and for your first appearance in your roles. That concludes our hearing.