



HOUSE OF LORDS

International Relations and Defence Committee

Corrected oral evidence: Defence concepts and capabilities: from aspiration to reality

Wednesday 22 June 2022

11.30 am

Watch the meeting

Members present: Baroness Anelay of St Johns (The Chair); Lord Alton of Liverpool; Lord Anderson of Swansea; Baroness Blackstone; Lord Boateng; Lord Campbell of Pittenweem; Baroness Fall; Baroness Rawlings; Lord Stirrup; Lord Teverson; Lord Wood of Anfield.

Evidence Session No. 12

Heard in Public

Questions 85 - 92

Witness

I: Air Marshal Edward Stringer, Assistant Chief of the Defence Staff (2015-18), Director-General of the Defence Academy (2018-21).

Examination of witness

Air Marshal Edward Stringer.

Q85 **The Chair:** Good morning and welcome to this meeting of the International Relations and Defence Committee in the House of Lords. We have Air Marshal Edward Stringer, retired, who was director-general of joint force development between 2018 and 2021. Welcome, and thank you for giving evidence today to our inquiry on defence concepts and capabilities, from aspiration to reality. As ever with our sessions, this is on the record; it is broadcast and transcribed. I always remind my colleagues that when they ask questions, they should ensure that, if they have a relevant interest to declare, they do so at that point.

As always, I will ask the first question, which tends to be very broad, and my colleagues will ask more focused questions. When I turn to my colleagues, I anticipate that they will wish to ask a supplementary related to their initial question. After that, if we have time remaining, I invite colleagues to ask questions that may range much more widely.

To start off with a very general question, the Integrated Review and the Defence Command Paper, both of which were published now over a year ago, outline a very ambitious agenda for the UK's foreign, security and development policies—let alone defence, as a separate Command Paper. As such, some of our previous witnesses have cast some doubt on whether the reality can actually be achieved against a background of such wide ambitions, in terms of both available resources and future spending that has been provided, and whether the Government can achieve all their stated goals. Do you share those concerns, some of which we have heard? Thinking about the goals set by the Government, where would your priorities lie? Are there some lesser priorities that could in fact be delayed or even shelved?

Air Marshal Edward Stringer: Thank you very much for the question; it is very broad but also topical, not least with what is happening in Ukraine at the moment. I am sure Admiral Radakin will have touched on that.

I shall briefly comment on the relationship between the Integrated Review paper and the Command Paper. An opportunity was slightly missed with the Command Paper, which uses the same aspirational language as the Integrated Review, which of course was not purely about defence. It maybe missed the opportunity to make specific some of the hard choices that defence will have to make, given your very apposite question. The first half of the Command Paper rather repeats the aspirations of the Integrated Review and then goes into what we are going to do with the services. You can pick holes in that. If we are going to persistently engage, is it therefore right that we draw down the RAF's air transport fleet, for example? You cannot answer that question if you do not describe what persistent engagement looks like. I know the Integrated Review team believes that the MoD was going to publish a strategy for persistent engagement, but I do not think it has yet.

However, we must not fall into the trap of thinking that persistent engagement is always a battalion of infantry sent forward around the world and maintained there at great expense. The AUKUS deal shows us how you can have strategic impact with a range of persistent engagement. We will now be able to persistently engage in the Pacific, which pulls in most of the services and a lot of force development activity, if you look at what is in the AUKUS deal.

If you think about how you can now link people in a virtual world, you can conduct a huge amount of very valuable training which does not require people to be shipped around the world at great cost. Sadly, most of it remains in the very classified realm, but we have helped friendly nations in cyberspace, and we have done it from pretty innocuous-looking office blocks or doughnuts in this country. With imagination and, let us face it, a £40 billion-plus defence budget, which is 10 times that of Ukraine, you can address the key tenets of the Integrated Review. However, you are going to have to sketch out in the next iteration of the Command Paper exactly how—I have given some ideas today—you would make those hard choices and what some of the aspirational language means in practice.

Q86 **Baroness Blackstone:** Can you tell the committee a bit about how you assess the whole process of developing the Integrated Review and the Defence Command Paper? Looking back, are there ways in which it could have been done better and changes you would have liked to see in the whole process of doing all the work that reached these conclusions?

Air Marshal Edward Stringer: Inevitably, this might come across as therapy, for which you can bill me later. Way back, I stole the word “winning” from Lord Stirrup, who I believe wanted to put it into the Air Force motto at one point. It is a very good word. Four years ago, I arrived at my last job wondering what was missing from defence—I think a question might come up later on SONAC.

What I believe was missing from defence was continually re-evaluating the theory of winning to keep you ahead of the opposition. When you deploy force, the theory of winning is obvious; it is compelling, it is obvious to your allies and even more obvious to your foes. We set out to take the previously unrealised idea of joint force development and integrate those units I had under command, many of which are very impressive, such as the Development, Concepts and Doctrine Centre—the DCDC, which I am sure many of you will know—the Directorate of Joint Warfare, the Defence Academy and the Royal College of Defence Studies, and pull the combined output of the thinking power of the services into really thinking through what a theory of winning looked like.

If that is the intellectual engine, we then set out to create a gearbox in defence by which you could control the spend, which under the V model is delegated to the four front-line commands, including the three services. It worked well up to a point; maybe we will come back to exactly how it got embodied under the change from joint forces command to strategic command, but I would argue that something got lost in there,

even though it was my organisation which wrote the integrated operating concept and a thing called the future operating concept, which is being held within the MoD.

I know that the current Chief of the Air Staff, Air Chief Marshal Sir Mike Wigston, greatly liked the future operating concept and instigated a great deal of thinking at RAF High Wycombe. Nevertheless, when the Integrated Review kicked off, we found ourselves not really used by MoD head office. So, quite bizarrely, the joint force development organisation was rather marginal to the Integrated Review, except for occasionally writing think pieces and papers for the then Chief of the Defence Staff, General Sir Nick Carter, some of which got through to John Bew and his team. You will have to speak to that team, but I sense that they felt some of the proposals from the MoD were quite defensive of the current equipment programme and maybe not quite as imaginative. Of course, you have to factor in that, when you have the presence of someone like Dominic Cummings hovering over the team, some of the proposals could have been overimaginative.

Nevertheless, to go back to your previous question, it was a great opportunity to think through what the future of warfare looks like, not just in terms of whether we are building the force that is the next iteration of that but whether we are setting the conditions by which we can continually update our forces. I think that is the opportunity that has been missed. If you move from, as I would argue we are, the industrial age to the information age, when a lot of our capability is software-driven, you are having to procure capability as software but, importantly, continually iterated software. I am sure you all have laptops, and some of you will have Apple ones. You will download a patch and update it without really thinking about it. You do not know what you have contracted for there but you trust Apple to work on security, upgrade your software and keep it right. That is not the way that defence goes about buying things; we have to spec everything in advance.

Those were all opportunities for the Integrated Review to think through a modernised force that were perhaps missed. I hope that the Secretary of State, Ben Wallace, with his creation of SONAC, which has exactly the same intellectual roots, will have better success with the next iteration, but we have wasted a couple of years.

Q87 **Baroness Blackstone:** The Integrated Review is a summary of the ideas and proposals from at least five government departments: the Foreign Office, DfID, as it then was, and the Treasury, up to a point, as well as the MoD. Do you think that, as a result of the interdepartmental debates that took place, it turned out to be too aspirational and did not have its feet on the ground quite enough? Do I detect that in your answers regarding the implications for the defence side from all these different departments?

Air Marshal Edward Stringer: You do very well to remind all readers, especially those who come at the Integrated Review with a defence mindset, that it is about much more than defence. I also suggest that

when it was written, with the pandemic as a backdrop, all sorts of departmentally institutionalised attitudes were changing very fast, not least on China. If they were here, I think the Integrated Review team would tell you that they might have been a little firmer in their language in that regard, but not every department had moved as far forward as others had.

Actually, the Integrated Review team have done a rather good job under John Bew in synthesising some broader strategic considerations. I argue that the Government have not been very good at modulating departmental policies based on broader strategic considerations. You have only to look at how various departments have interacted with China over the last five to 10 years to see that, or one could look at energy security policies and so on.

I do not think it is a bad thing that they were brought together. It took some time to redraft the document, and the drafts changed considerably in the gestation of the review, but it is a pretty solid product. All the ideas are there for a more joined-up and integrated Government to think through some of these pivotal policies—whether that is climate change, the rise of China, the move of economic and therefore political and military power to the East—and apply that geostrategic understanding to a range of departmental policies, even within each department, that might not look perfect from their own perspective. To that extent, I think it was a good thing.

Q88 **Baroness Blackstone:** I want to move away from the Integrated Review to the Ministry of Defence. Can you assess its suitability, in the light of its culture, structures and processes, for delivering the ambitions of the Integrated Review and the Defence Command Paper?

Air Marshal Edward Stringer: That is a fantastic question. The commentariat tends to comment on policy qua policy, not on the much more important element. Bright ideas are 1% inspiration and 99% perspiration in the delivery.

To cut to the chase, I think the problem is the Levene review. I am afraid that one ex-Chief of the Defence Staff that I have not spoken to about this is Lord Stirrup, here on your committee, but several that I have spoken to in private will admit that they feel it is limiting. Just as the Integrated Review talks about forces that are centripetal, having to build a force where all five war-fighting domains, including cyber and space, are integrated in the theory of winning from the off, Levene has been centrifugal. It spins the money out very early to the four front-line commands, and then rather hopes that when they put their forces on the table they can gel them together and they are going to work. That is a slight simplification but not too much. MoD head office needs to address the effect of Levene in practice. When you reread Levene, his assumptions are quite interesting. I think he rather assumed that the whole of the military would be very joint now in its very DNA, but I am not sure that is true. If you set the incentives down single-service channels then you are going to get single-service approaches.

Then there is the question of whether head office has the mechanism to create that theory of winning, the blueprint for the joint force, and do what I think Levene intended, which is, in a world where there is never quite enough money for everyone in defence to do what they want, to allow the experts in their environments—the three services plus Strategic Command—to make the necessary hard choices and decide which bits they are going to take risks on.

Clearly that is where the Secretary of State, Ben Wallace, has concerns. That is why he has created SONAC. In his RUSI speech on 11 December 2020 he laid out the concerns that he had with his own department. Those changes are a work in progress. We are now in 2022 so I hope—with the various reviews into head office structure and, I understand, the future of Strategic Command—that this is ratified quite soon. The structures at the moment make the process of achieving the integrated, modernised, transformed and digitised joint force that is possible very difficult, certainly in short order and within the budget.

Baroness Blackstone: Surely what you are setting out needs to be very flexible and very subtle in being able to adjust to rapid changes within the constraints of a budget that is not necessarily going to go on going up. What changes do you think are needed in the structures of this pretty large department? What changes are needed to how it operates and to its culture?

Air Marshal Edward Stringer: Am I king for a day in this answer? There are three things that I would do and they are all cost neutral. The first, against the traditional set-up in the MoD, is that I would formalise the creation of a military strategic headquarters. It is important if you have an integrated force that under the Chief of Defence Staff you have a military strategic headquarters in the MoD. It is referenced to as such but it is a virtual construct; really it is the current operations desk, so the totality of the military force is not really commanded as a whole force until an element of it is deployed on operations.

The second thing I would do to address culture is to put incentives in place to get back to where I believe we were five to 10 years ago, when being joint was definitely the avenue for career advancement; indeed, it was mandated. In officers' confidential reports, your attitude to being joint and your experience in the joint world was a vital attribute to have. Given the way that things such as senior appointments committee work, I think you could create a virtual joint staff. Officers who got to one star and wanted to make two stars would have to be promoted into a joint staff, and then the single services could buy them back for single-service appointments.

The third thing I would do is beef up the defence board. I was asked to write a paper just before I left for the Secretary of State on creating SONAC. I inspected his speeches, and went and got the last two years' worth of defence board minutes and agenda. There was not really one meeting that discussed what the future force looks like, what the theory of winning is or how we position defence. Instead there was a lot about

the secondary considerations and of course on money and spending, as well as lots of HR stuff at the moment.

So I would consider whether the defence board were to be beefed up and then set the military strategic headquarters and department of state some very clear direction. With officers who were genuinely joint by instinct, you would have a much better chance of creating and continuing to sustain that integrated, modernised, digitised joint force that both the Integrated Review and the Command Paper speak of.

Q89 Lord Alton of Liverpool: I want to build on what Baroness Blackstone has been exploring with you as well as what you have been saying about the theory of winning and how that requires an integrated cross-government, cross-departmental approach. Previous witnesses have told us about the importance of establishing effective cross-government working relations to the integrated operating concept and the role of the National Security Council, which has not been mentioned so far, in driving and co-ordinating such work. How is the integrated operating concept organised? How is it operationalised and then measured? Do you think the current institutional set-up effectively and efficiently achieves that goal? What changes or improvements would you make that would enable it to do so?

Air Marshal Edward Stringer: I shall try to be brief because, as you say, this builds on my previous answer. On the integrated operating concept—and thank you for pulling out what have clearly come across as its clear tenets, which are to be integrated across the services but integrated across government—you never know what the next conflict or operation is going to look like; I could throw out the famous Michael Howard quote here. That is why I believe you need a military strategic headquarters. You need to be able to modulate the force you have and move resources around, since it might be that certain elements of the services find themselves a bit underfunded now while others are getting the resources. That is difficult to do under the Levene model but would be needed.

Back in 2018, working with the then strategy director, a civil servant called Will Jessett, we put that proposal to the MoD and indeed had it accepted. Had it gone forward, there would have been some proper teeth to the Defence Force Development Board which had three heads of what you might well see as ends, ways and means. Ends would be military strategy and operations, means would be finance and military capability—I could put names to these but I will not—and ways would be joint force development. Under the vice-chief, working alongside security and policy and ops, they would be able to adjust strategies in between strategic defence reviews. A criticism of the civil servants in that area is that they tend not to have a lot to do in between strategic defence reviews. We have to be able to modulate the force in being to get it able to do things and come up with novel ways to allow us you to create strategies that maybe were not imagined when the big decisions in force design were taken.

If that works across the MoD, you then need to integrate that across government. When there is a pressing need, especially when there is such a forcing function as counterterrorism, that can work very well. Jeremy Fleming, director of GCHQ, has spoken about how various government departments came together to defeat Daesh, its propaganda and finances. That of course was in the early days of the fusion doctrine of Mark Sedwill—now Lord Sedwill—which I thought worked rather well. It has gone a little quiet on that bearing; I am not sure how Sir Stephen Lovegrove, who is the current national security adviser, has positioned the fusion doctrine in his reign, but we could have built on some of the great successes, such as the Foreign Office-led countermedia for Daesh—and generated a range of cross-departmental national strategies.

Another point is that with the creation of elements such as the Joint Expeditionary Force, the force development that was done is now being done for 10 north European nations, not just one. As an agent of international influence, if you can pull this integration across a coalition—maybe even an alliance, with our linkages to NATO across government—then you are achieving very powerful international effect.

You mentioned the National Security Council. Going back to when Mark Sedwill set up the fusion doctrine, I always considered that the NSC was always a little undergunned in the national security staff. I would consider a slightly larger, more dynamic staff to put novel papers to the council.

Lord Alton of Liverpool: On this day last week we commemorated the 40th anniversary of the liberation of the Falkland Islands—as a young MP I sat in the House of Commons when we decided that we had to send the task force as it was a war that we had to fight—and I was struck by the fact that part of the problem had been the breakdown in intelligence and the sharing of information between diplomats, politicians and the military. I thought one of the great achievements of the Cameron Government in 2010 was the creation of a National Security Council. Should it be down to the whim of individual Prime Ministers how often it meets, what it does and how it goes about the kind of business that you have just outlined?

Air Marshal Edward Stringer: It is very kind of you to offer me the platform to discuss the whim of individual Prime Ministers. I think government would work better if there were a slightly more established deep state that could then deal with political control, as of course it must, but the procedures across departmental working could be better. We facilitated that; as I say, I worked closely with the national security adviser, Mark Sedwill, when I was director-general Joint Force Development, and we took most of the DGs across government to Wilton Park, near the south coast. The morning of the third session of three was all about linking departments better, data sharing and what have you. So there are some constructive things that the Government could do, especially on the sharing of data, when the culture at the moment is still “Knowledge is power”, even within departments themselves. There is evidence of that from only last year—lots of evidence.

One of the things that I think the national security adviser could do is to push a little harder on the idea that everyone got around back in 2019 of migrating government data into something much more like a cloud structure such that everyone can make use of it. Just think of the benefits outside of your committee's overview, international relations: think about the health benefits regarding obesity, for example, if stats could be shared across all sorts of areas. That would start to break down some of those stovepipes. Then if a beefed-up national security staff generated some novel concepts, some thinking on evolving strategies and producing them, the Government would have to react to that.

Q90 **Lord Anderson of Swansea:** Previous witnesses to our inquiry have stated that both the review and the Command Paper make a bet that technological transformation can trump mass in our Armed Forces. Do you believe that the one lesson of the conflict in Ukraine is that that balance has to be re-examined? Certainly Russia appears ready to expend vast quantities of arms and, alas, its young people at scale on the conflict. Do you believe that the theme of the Integrated Review and the Defence Command Paper still stands?

Air Marshal Edward Stringer: I shall attack that question in two ways. I shall come on to military and strategic cultures but first I shall address pretty directly the question about the bet. The Integrated Review and the Defence Command Paper, which I was not involved in writing, and the integrated and future operating concept, which I certainly was, are of course all trying to move the tiller, so what you tend to write about is the movement—you write about what has changed rather than what is constant. However, when you read them, every single one of those documents will say, "The nature of warfare hasn't changed. It is nasty, violent, brutal and personal." If I may quote my friend and colleague Angus Lapsley at the MoD, who understood what we were saying, he said: "Moving to grey-zone ops doesn't mean you don't need big grey things."

You certainly need—and this helps you to get the most out of the mass you have—to integrate the force better. That involves much better use of cyber and space domains. Without leaping ahead to the subject of Ukraine just yet, just look at what Elon Musk's Starlink is doing in that country at the moment. No one has said that warfare does not involve the exchange of huge amounts of violent energy, so mass is important, but how you define it is important as well. Were we to define the Royal Navy in mass terms, there were—what was it?—1,500 to 2,000 sailors on a battleship in the first and second World Wars. The warships of today are much more powerful but with complements of 200 to 600, so it is not all about personnel. The US Marine Corps is looking at companies that go down to 40 humans because fire support and intelligence, surveillance and reconnaissance might be done by robotics and drones. However, there are interesting questions about the resilience if you only have 40 humans.

So to say that the bet was taken that you could move away from mass and physics and replace it all with grey-zone computers, data and cyber

is reducing slightly oversimplistically some of what has been written. Most of us who were talking about the future of warfare were saying that you need to stitch your war-fighting materiel together better; you need better, quicker, agile command and control; and you need longer range because you will be able to find enemy forces in ways that were just not achievable before. That is being shown in Ukraine.

To come to the question of Ukraine, I will be very interested to see what happens with Russia. Of course an autocrat can force people on to the front line, but the intelligence is suggesting that there are desertions and units of the Russian armed forces refusing to go to the front line. Looking at the demography, Russia does not actually have the mass. Putin would have to mobilise pretty much the whole country to be able to generate the mass that we assume he can, which would be politically difficult.

Lord Anderson of Swansea: In a special military operation.

Air Marshal Edward Stringer: Indeed. Whereas he is up against a country that is one-third to one-quarter of the size in manpower but every last one of them is motivated. So it is an interesting question. I would not agree with the previous panellist that this bet is wrong, but it is how exactly you deliver in practice this new theory of winning with space, cyber and automated weapons systems—with all the legal and ethical implications therein thought through—that will actually answer the question. Until you do that, it is very easy to paint the left-hand and right-hand sides of it.

Lord Anderson of Swansea: An ancillary question: do you share the view that there is a danger in the time gap between the phasing out of materiel and new operations and the phasing in of new technology, and that there is a danger of holding on for longer to sunset forces until sunrise technologies have proved themselves from experience?

Air Marshal Edward Stringer: In a perfect world, you would love to be able to build the force of the future while keeping the one that you have got, have a period where you have both, and then retire one. I do not think the Treasury is going to fund that so you end up having to decide where you are going to take the risk.

This is where I come back to my previous answer. Only when you have defined how you are going to deliver lethality into the battlefield, how you are going to use longer-range weapons systems to hit the opposition before they even know you are there at ranges where they previously thought they were safe—all those things are possible; the future operating concept and the integrated operating concept sketch how it might come to pass, and in some ways the Ukrainians are demonstrating it on a small scale at the moment—can you decide how you are going to retire the current legacy order of battle.

If you are sensible, you do this with your allies, and you therefore burden-share on some of the risk. Just one thought on that: if you were going to modernise the UK land forces at the moment, given that the

NATO nations peripheral to Russia look like as if they will be heavily investing in land armoured forces, and Russia is depleting its land combat power at the moment and will find that hard to replace if sanctions hold, there might be a window for us to modernise those land forces, just as the Swedes did when they gave themselves a holiday in the 1990s and came up with the Bas 90 concept.

So, if strategically informed, you can shift from one epoch to another, and indeed you must. I do not think the Treasury will allow us the luxury option so I think that the sensible use of alliances and managing the risk appropriately will allow us to do it, but it will have to be done in concert with our allies and partners.

Q91 **Lord Stirrup:** Air Marshal, I would like to draw together some of the things that you have already said today and probe a little deeper. The Defence Command Paper places great emphasis on research, innovation and experimentation in order to provide new battle-winning capability, I am a great supporter of that and always have been, but I am also a great sceptic about our ability to turn that into reality on the ground, in the air and at sea. A short cautionary tale: when I was in charge of defence equipment capability in 2002, we had no unmanned aerial vehicles in the British military. I wanted to buy a few off the shelf from an American company and set up an experimentation unit to start playing around and see what they could do and what use we could make of them.

I was prevented from doing that because it did not fall in line with our procurement practices and there were fears that it could cut across other competitions that were being run, so all of that came to naught. The previous CDS has told this committee that the UK is probably better placed than most other nations to bring that sort of research and innovation into front-line service. You have talked about some of the ways in which the thinking could be done, but it has to go all the way into capability that is in the hands of war fighters on the front line. As you will recognise, that is a long chain. If one is to be truly innovative then one has to take risks and make very careful judgments because one is thinking outside the box, and there are a lot of wacky ideas that turn up and most of them are just that—wacky ideas. One or two of them, however, are pure gold, and those are the ones that one has to pull through to capability.

Why is the UK better placed than most other nations to do that? I see no evidence of that so far. I see no evidence that our best minds are being put into the risk-taking and experimentation business. I see no evidence, going back to Baroness Blackstone's question, that the structures and, more importantly, the culture within defence are amenable to that sort of thinking and that sort of innovation. What would you say to that?

Air Marshal Edward Stringer: I would agree and expand on agreeing with you, Lord Stirrup. I have read those transcripts. We may be as well placed as some other nations but there are others that are doing things a lot better. One has only to look at Israel or indeed at Ukraine now, where reservists with a laptop hooking up to the cloud, provided perhaps by

Elon Musk, and using geospatial intelligence that is commercially available are taking on what we previously thought was a military superpower and out-thinking it. You know as well as I do that if any of those elements were suggested to UK defence, it would be shock and horror: "No, we need our own bespoke solution. Now write me a cheque for £200 million." That is why I came into the job under the then Chief of Defence Staff four years ago, to try to build such an organisation.

You would think that if we were absolutely behind the whole idea of innovation, we would know where our spend went. I did some work on this just before I left, so this would be October 2020. It took a lot of work and longer than we thought to find out where all the money was going on experimentation—I wanted to know because I was trying to form the defence experimentation pathway—and even the front-line commands do not know because they do not log it. It is just an expense of a programme: "We'll book some Defence Science and Technology Laboratory time and they will do a bit of experimentation for us." If you had Gary Aitken in here, the head of DSTL, he would probably be quite strident about the fact that he saw his organisation doing the same thing four times, at four times the expense—and that expense is £1 billion a year. So between the extraordinary settlement that the MoD got in 2020 and Joint Force 25, the current external programme being realised, the MoD will have spent £4 billion a year one way or another—that is just what DSTL is going to spend plus my budget of £200 million—so over four years that is the same as the Ukrainian defence budget in toto. That could be better spent.

I have always found that pulling together a tiger team of the best and brightest minds from around my organisation has allowed us in a few weeks, or maybe a couple of months, to generate some good ideas. Those then need testing. If we had that culture, as I mentioned right at the start, under a military strategic headquarters, the test would be there of the single services. My interpretation of what you said, Lord Stirrup, is that there is conventional stovepipe thinking in all the services. If you could test that and make them justify sticking with the same old, same old, then you would get some innovation.

It would be good if you could spend the £4 billion more centrally. I knew who my Chinese opposite number was in Beijing, running the academy of military science, and he could test these things because he had that budget for innovation, whereas we parcel it out to the four front-line commands and the three services, which then to some extent battle each other, do they not? Sometimes, as I say, they work on the exact same projects four times over.

I come back to the question of whether we have the resources to deliver the Integrated Review. Yes, but if we spend more efficiently. If you were to say, "Over the next four years the Ministry of Defence is going to spend £4 billion on innovation and experimentation. Let's have a plan for that", then you need to know what all the areas are, as the very good chief scientific adviser, Dame Angela McLean, has laid out, but the

mechanism behind that still involves too many fiefdoms competing with each other for a genuinely centralised theory of winning to emerge. The defence experimentation group, about which I wrote a paper just before I left, would do just that, and I still think it would be a benefit to defence if that were taken forward as a policy.

Lord Stirrup: We are talking about defence here, but this kind of approach has been suggested by the Government more widely within the UK, and setting up ARIA is of course a part of that. In your view, is there scope for close integration across various departments, businesses and industries in technological terms? Not all the ideas come from defence, and not all the best ideas for industry come from industry. Do we need better and wider integration of this sort of innovation approach in the UK economy?

Air Marshal Edward Stringer: Yes, and I refer to the answer that I gave Baroness Blackstone earlier. The Integrated Review, in pulling a few departments together outside the traditional defence and security ones is a good idea to make that thinking more central to the way in which the Government operate. I would add to what you have said: pivotal to that is the Treasury. As we move from the industrial and analogue age to the information and digital age, across government we are going to be buying digital-age capabilities that are software driven.

In preparing for this meeting I rang around my friends in the tech industry, from large primes to start-ups, and they are all tearing their hair out about dealing with the UK Government. You cannot buy software as a service in the same way that you buy an aircraft carrier, and, as you said, the Government are increasingly going to rely on those sorts of services. The innovation comes from the tech sector but we are killing that sector at the moment. These friends and colleagues tell me that their investors, boards and shareholders are saying, "Drop the MoD and the UK Government and go to the commercial bit where people move quickly". If we do not reimagine that relationship and exactly how we procure these services, it will be a lose-lose proposition. The Government will not be able to draw on the services of the tech sector, and the Government will not be stimulating the tech sector in areas where they could be supporting it. Do I have time for a small vignette?

The Chair: I do not think any of us want to stop it.

Air Marshal Edward Stringer: We match funded with industry a technology-demonstrated programme with one of the first unicorns in the country, which took a bit of pushing through because we used the then Secretary of State's innovation fund. We created a thing called a digital twin. Does that make sense? You can make a digital twin of a country, and we have done one of with the war-fighting area out to the east. It was a bit of a risk because no one globally had done this before. We did it because we knew that others, our foes, were trying to build these things. We thought, "Let's see. If we can't do it then we will still have learned something". But we found that we could, and that was the core of what

you will have read about in the IR and the Command Paper—the digital backbone.

One year into it, we went to continue the funding because it was going very well, only to find that the element of the Cabinet Office that approved contracts had removed its permission for the previous year. The delay in refunding it meant that the design team was very nearly dismantled because their company could not afford to have them hanging around doing nothing. Meanwhile, another part of the very same Cabinet Office in Whitehall was going to that company and saying, "Can you build a digital twin of the UK to help us to recover from the pandemic?" So it is not even left and right hands of the Government; it is the left and right hands of one building.

I have examples from the services as well; no one is immune to this. No one was actually doing anything wrong. That is why I say the Treasury is important. If you do not set the rules, conditions and incentives then people will not do what happened in the first year.

The very good civil servant who was in charge of the money actually signed it off after a barrage of phone calls from the high command and staff—called "staff ride" in France—and at the end of it he said, "Edward, I've signed the contract. I know it's probably the right thing to do, but I have to tell you it was a very heavy pen when I signed it", because he knew it was non-standard. So there are cultural things here that, unless we change the culture across government, we are forcing people to go against the grain to deliver and leaving them feeling exposed. That is not how the Government are going to advance rapidly.

Q92 **Lord Teverson:** Air Marshal, you served as Assistant Chief of Defence Staff in 2017-18 when Donald Trump became President of the United States. You had a senior position in Washington during your career. It is not unlikely that Mr Trump or one of his Republican lookalikes might become President again in two years' time. How do you feel we should prepare for that, and what difference do you think it would make to NATO?

Air Marshal Edward Stringer: That is such a political question, isn't it?

Lord Teverson: It is and it is not. I am not asking you to judge.

Air Marshal Edward Stringer: Actually, 2018 was the year I started in joint force development. By way of answering your question, though, I will say that in that first year when we were generating a plan for the theory of winning and joint force development, which was going to be this creative engine thinking through theories of winning, I realised there was no point in doing that nationally. What is the point in having a British-only digital backbone? So everything was JEF.

My first office call was with the commander of NATO Allied Command Transformation in Norfolk, Virginia, Denis Mercier, who I happened to know through Air Force connections. I offered him my team so we ended up writing the NATO doctrine as well. Then I popped up to Washington to

my equivalent in the J-7 and we were ahead of the game. In fact—as Lord Stirrup and I were talking about tiger teams—the then Chief of the Defence Staff, Nick Carter, moved the bright Navy captain who had led the tiger team in creating this engine into the Pentagon on exchange to help the then vice-chairman, John Haydn, to get to grips with how they were going to generate their own integrated operating concept, a thing called JADC2: joint all-domain command and control. It was all looking rather good at that point. After that it gets national; I have covered that and am not going to go back over it. My point here is that there are great links that go on in what is sometimes dismissively called the deep state. Those linkages are strong and I think we forget them at our peril. In some of my appointments I have been around capitals and have sometimes had to rebuild relationships. We as a nation are a bit fickle.

If I may generalise your question, it is about how you insure against political shock. I think you do so by making sure that relations between the nation states are strong. There are fundamental values that go back centuries, including legal systems and some of the deep cultural linkages between societies, and ultimately, as I think we are seeing in Ukraine now, that underpins your resilience and your security. After all, why do nations fight each other? So that can transcend any short-term political shock. But if we ignore those relationships and take them for granted, and sometimes we do so for penny-pinching reasons, then we are not investing in a necessary insurance policy.

The Chair: Air Marshal, thank you for a session in which you have given us great clarity about the challenges both here and now and in future. You have given us some really good steers on your view about how those challenges could be met if people were prepared to make the right decisions.