HOUSE OF COMMONS

Science and Technology Committee

Oral evidence: Work of the Minister of State for Universities, Science and Cities, HC 729

Monday 20 October 2014

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Watch the meeting

Members present: Andrew Miller (Chair); Jim Dowd; Mr David Heath; Stephen Metcalfe; Stephen Mosley; Pamela Nash; Sarah Newton; Graham Stringer

Questions 1-48

Witness: **Rt Hon Greg Clark MP**, Minister of State for Universities, Science and Cities, Department for Business, Innovation and Skills, gave evidence.

Q1 Chair: Minister, welcome to our session this afternoon. I am not the first one to do this, but welcome to what I reckon is the best job in Government.

Greg Clark: It certainly is.

Q2 Chair: Before we start the formal business, you will be aware that, among other things, this Committee is undertaking a piece of work as a legacy report for our successor Committee to consider. We have already put quite a burden of work on to some of your staff, but we would like to remind them that, as quite a few of our reports related to the Government Office for Science, we will be expecting some substantial evidence back from your office about progress towards the recommendations and so on. Hopefully, before we publish the report we will have you in front of us again to talk about some of that progress, but today we want to talk about the job in its broadest sense.

Greg Clark: Thank you, Chair. I agree with your judgment—this is a fantastic job. I know this is a particularly active Committee. My experience as a Minister has always been to take advice from Select Committees such as this. I know that you have acquired a particular degree of expertise over the years, so I hope that we will have occasion to meet each other regularly. I give you an assurance that I will always take your recommendations very seriously.

Q3 Chair: You are on record as saying that your brief is to continue the "brilliant work" of your predecessor, David Willetts. Does that mean that we are unlikely to see any significant policy shifts this side of an election?

Greg Clark: The first thing to say is that David did a fantastic job. He devoted himself to winning the respect of the community and I would certainly want to continue the direction that he set. There is a broader point as well. In science policy, David very much built on the work of his predecessors and took a bipartisan approach. It seems to me that there is something important in that for UK science. We have a globally unbeatable reputation that has been built up over a period of time and we want to keep faith with that. However, that is not to say that there are not some major tasks I have to work on and some progress I want to make.

For example, as the Committee well knows, around the time of the Autumn Statement we will be making some decisions on the science capital programme. One of David's achievements was that he not only protected the science budget but had a real-terms increase in the capital allocation, so we have some very important decisions to make on that over the weeks and months ahead.

I am enjoying working hard on the science and innovation strategy, which will appear at the same time as the Autumn Statement. That is a very important opportunity to project forward for a whole decade the principles on which we should base science and innovation policy, to reflect some of the changing aspects of the world and the UK and the debates we need to respond to. Perhaps we will go on to talk about that.

As some members of the Committee know, for the last few years I have worked on trying to establish in Government policy a recognition of the importance of place. It seemed to me that in the past national policy had sometimes undervalued the impact on, and the contribution to, policy and success that particular cities, towns and counties can make. I want very much to use the opportunity to bring them together to the benefit of our towns, counties and cities—and of science.

A fourth priority—not in rank order—is that while we have made progress in higher education in terms of admissions to university, especially of people from disadvantaged backgrounds, the diversity that we see in the leadership of both our universities and our research institutions does not always reflect the talent that we have elsewhere in the organisations. I know that is a shared view across some of the institutions and would like to do what I can to help the issue to be rectified.

I will continue David's approach, but those are four areas in which I would like to make some substantial progress over the months ahead.

Q4 Chair: Are we to conclude from your comments about the combined responsibility that you have for cities, universities and science that this is an attempt to embed science more into the plans for local growth?

Greg Clark: There is a big opportunity to do that. If I may take your part of the world, Chair, you know that science's contribution to the future prosperity of Cheshire, Merseyside and Manchester is absolutely essential. One of the area's key strengths is in science. I reflect with some pleasure on the deals I have struck with the cities and local enterprise partnerships, which have invested in research parks and facilities to make sure that the economy can continue to benefit from the scientific excellence that is there. That is taking place in other parts of the country as well. Last week, I was in Cornwall. Sarah

Newton came along to the signing of the growth deal that we did on the Penryn campus of Falmouth University and Exeter University, where we are investing in science facilities.

It is also interesting to observe how the leaderships of universities and research institutes have taken their place in the leaderships of their local economies. Every local enterprise partnership now has a vice-chancellor or a very senior academic on the board, not because they were mandated to but because university and research leaders are leaders of their local economies. This is coming together. It is happening around the world as well, so it is a good time to recognise that—to the great advantage of both, I hope.

Q5 Chair: We will certainly be delighted to see you out and about in the regions. As Chair, I will be totally biased and say that when you are in the north-west you should bring your cheque book with you.

Greg Clark: I will check whether I am coming up to you soon.

Q6 Sarah Newton: I am very happy that you mentioned that you have some impending decisions on the capital programme for science. This Committee did an inquiry that very much supported a £97 million investment in the Met Office supercomputer. I was wondering whether that business case had been signed off.

Greg Clark: It is a very important business case—another good example of how Government, working together with some of our most prestigious institutions, can make a big difference. I was at the Met Office last week and can say that that supercomputer has been agreed and we will be investing in it. It is a huge deal for the country and the world. As you said, it is £97 million. It will bring wider benefits not just to the Met Office but to our reputation in forecasting, with all of the consequent commercial and research advantages that come from that. I have been down in Exeter; as you will know, the University of Exeter is very closely involved with the project. That is a good example of a way in which the Government can back success and build on our excellence, to the great advantage not just of the south-west but of the UK and the world.

Sarah Newton: That is good news.

Q7 Stephen Metcalfe: Good afternoon, Minister. You are a dual-hatted Minister now, with responsibilities both for universities and science and in the Cabinet Office. There are some who see that as positive and some who think that you may be spreading yourself too thin. How do you balance the responsibilities between the two Departments?

Greg Clark: As I expected, I am finding that they are very integrated. I have mentioned the visits I made last week in the west country. I did a number of visits. We signed the local growth deal I had been responsible for. In fact, we signed two—one was at the university campus and science park at Penryn in Cornwall, while the other was at the Exeter university campus in the city of Exeter. Through my work on cities, over time, I have got to know quite a lot of the vice-chancellors who have led that work. For example, Nancy Rothwell in Manchester is someone who is very well known to this Committee; some members know her with their constituency hats on, as well as through their

membership of the Committee. Vice-chancellors have been very involved in this work. I find that the difference between these portfolios is often non-existent and that they are two sides of the same coin.

Q8 Stephen Metcalfe: So it would be wrong to describe the Science Minister now as a part-time role.

Greg Clark: Completely. If you take some of the growth deals that we have been negotiating, science has already been very prominent in those. This affords me the opportunity to insist that science is a big part of all of that. Sometimes, there have been opportunities for getting some of the available investment that is connected with local growth into science, which has a big contribution to make to that. I am just scanning the list of the visits I have made and the events I have attended over the last few weeks. The Met Office, the Exeter science park, the High Value Manufacturing Catapult, MIRA and Daresbury are all things you could visit with a local growth interest or with a science interest.

Q9 Stephen Metcalfe: Yes. I hope you do not mind my pushing you on this, but presumably you were fully occupied previously, as was your predecessor in their role. Either there was some doubling-up going on or there will be things that now do not happen because you are only one person doing, effectively, two roles. I want to find out whether that is a fair assessment. Help me and the Committee to understand.

Greg Clark: I think of the work that we have done on local growth. We have established a set of arrangements where substantial funding is now available—£12 billion to be allocated, of which we have allocated £6 billion. That involves contacts with the leaders of every place in the country. During my work of the last couple of years, I have met all 39 of the local enterprise partnerships, usually on site, so I know people in the areas. I believe in getting out and about and taking a personal approach. I will do that with both the science aspects and the higher education aspects, which very often are in the same places, involving the same people.

Take universities, for example. There are few institutions in our country that are literally synonymous with place, but universities tend to be called by the city or town in which they are located. That just shows how deep the connection is. I have not experienced any sense in which you need to make trade-offs; they are very consistent. Later this week, I will go down to Bristol with the President of Singapore to do a lot for science in Bristol and the collaborations that we have with Singapore, but that is a big thing for Bristol as well.

Q10 Stephen Metcalfe: Very good. On the positive side—I am sorry; I am not saying that what you have said is negative. I meant, one of the things that was seen as a positive when the roles were combined. Earlier this year, the Committee recommended that the Government Office for Science move to the Cabinet Office so that it could make better use of scientific evidence across the whole of Government. Should we see the combination of your two roles as an indication that that idea is moving forward?

Greg Clark: That is a very good, important question. The approach that I have always taken as a Minister is to believe that it is usually to the disadvantage of the country when we operate in silos. That is true of research institutes as well; we may go on to talk about that. There is a tendency in organisational terms for that to happen; Whitehall has been particularly prone to it. When I took on the responsibilities for local growth, I had the temerity to insist that it should be a cross-Government role, because every Government Department should have a role in this. When Mr Heath was a Minister, he served on one of the cross-Government committees that I chaired that tried to integrate that—and I think we made some progress.

I do not want to say that this is by any means new to science—my predecessor very much had a cross-Government interest, and the support of the Chancellor and the Prime Minister, in particular, has been very important in advancing the scientific agenda—but I bring to it a very strong personal belief in bringing the whole of Government together, rather than getting involved in erecting boundaries between Departments.

Q11 Stephen Metcalfe: Okay, but does that mean specifically that the Government Office for Science may come more towards the Cabinet Office?

Greg Clark: No. It is based in the Business Department and works well there. However, the implication that science is not to be corralled in a particular Department but absolutely has to inform the whole of Government—

Q12 Stephen Metcalfe: For clarity, you are happy with where it is but want to expand its role to reach out further across Government.

Greg Clark: Indeed. I do not want to do an injustice to my colleagues who work in the office, because I think it already does that, but that is absolutely right—and the more, the better.

Q13 Chair: In our report "Bridging the valley of death", which I do not expect you to have read cover to cover just yet—I hope you will have done so by the next meeting—we said that universities were well primed to deliver science to local economies. Do you agree with us that small local companies need to engage better with their universities? I cited an example of that on the Floor of the House a while back. In framework programme 7, we did brilliantly well through our universities but very poorly through our businesses, whereas the French topped the league in the SME sector. Can we get better engagement using the strength of those universities? Can you give some leadership to that?

Greg Clark: I agree with that. We have made progress. As I think you know, we are now considered to be—depending on the survey—the second or the third best in the world for collaboration between universities and businesses. That has substantially improved and there is a great recognition of it. However, I completely agree that we can go further and be absolutely unambiguously the place in the world to come to if you want to collaborate with the great universities that we have.

I do not want to give a progress around the country, but last week I was at Keele University, where I visited some of the companies that are being located in the University of Keele to benefit from the spin-outs, history and advice that are available there. That makes a big contribution to the university and to the local economy. For those businesses, it is a very productive and fertile environment in which to put down roots and to grow. That is a really important element and I want to see more of it. We have done it in the growth deals. Another big opportunity is to bring together the local growth and the science and universities agenda.

Q14 Mr Heath: On the connection between science and business, do you see your role as also being to act as a trade ambassador for our science?

Greg Clark: Absolutely. It is one of the most important responsibilities of a Minister. You have the opportunity, whether through visits or through people visiting us, to beat the drum for UK science and, indeed, business. Next month, I will travel to India, where I will be doing precisely that. Not only am I hoping to attract Indian students to study at UK universities, but researchers will be signing a collaborative agreement so that we can share research and, of course, the fruits of that in terms of technology and business.

Q15 Mr Heath: I may well be asking you to assist with the countries to which I am a trade envoy, so I am glad to hear that. Can I ask about another interface that you have? When I was with DEFRA, I did a lot of work with George Freeman in his then role as a special adviser on the life sciences. He has now appeared as Minister for Life Sciences, a completely new post. On the face of it, that seems to take a chunk out of your portfolio, and there is at least a possibility of unclear lines of division. Do you think you have a very clear focus on where the lines are between your responsibilities and his?

Greg Clark: Actually, it is a big step forward. One of the big advantages is that, in life science, the national health service and our medical profession need to be—and have been—closely involved in the science aspects. Bringing those together—and, to go back to Mr Metcalfe's point, bringing together two Departments that institutionally were at opposite ends of Whitehall and the rest of it and so may not have been as intimately connected as in the past—is part of this whole-government approach. George is a good friend whom I have known for many years; in fact, we had lunch today. We have a very good working relationship. He is doing some great work, particularly in making sure that we make the best use of the potential for innovation in the NHS and that we complement each other.

Q16 Mr Heath: So the NHS applications of science are clearly in his portfolio.

Greg Clark: Yes.

Q17 Mr Heath: But life sciences in universities are in yours. How does this work? I am still not absolutely clear on where the dividing lines are.

Greg Clark: I cite that as an example because he is a Minister in the Department of Health; perhaps colleagues did not know that. I do not see this as a question of dividing lines. He has a particular focus on the life sciences, but clearly life sciences are often, though not always, in universities and are part of the science arrangements that we have. We will work together on that. It would be the opposite of what I regard as desirable to have a sort of Berlin wall erected between our particular interests. We have the most collegiate relationship that it is possible to have. Sometimes, he will attend an event and sometimes I will, depending on what is most convenient at the time. As a Department of Health Minister, he will have a particular focus on the health aspects of the issue.

Q18 Mr Heath: But he is a BIS Minister as well.

Greg Clark: Absolutely.

Q19 Mr Heath: So communications are fine—you have no doubt about that.

Greg Clark: No.

Q20 Mr Heath: You will never have something that has fallen between you or is duplicated.

Greg Clark: I do not think so. Two hours ago, when we were enjoying a lunch together, we were talking about the science and innovation strategy. One of the points I made there was that it is very important that in the visits he makes he contributes any particular insights to the science and innovation strategy as we are drafting it.

Mr Heath: Excellent.

Q21 Stephen Mosley: I am interested in where you get scientific advice. Since you became a Minister, which of the various advisers and committees have you found most useful in advising you on science?

Greg Clark: That is a very invidious question, Mr Mosley, if I may say so—I should obviously say this Committee and its reports. I should have acknowledged that, as a Cheshire MP, you share some of the interests that have been pointed out here. One of the things you quickly discover in this role—and it is a fantastic discovery to make—is that you are advised by some of the leading brains and people of experience in the world—*[Interruption.]*

Chair: That is a vote, I am afraid. Can I suspend the sitting for 15 minutes?

Sitting suspended for a Division in the House.

On resuming—

Q22 Chair: It is now 16.56. We can resume, as we are quorate and the Minister is back in his place. You were explaining where you get scientific advice. Apart from praising us, what else do you have to say?

Greg Clark: There is no shortage of distinguished bodies. For example, the Council for Science and Technology advises the Prime Minister. I had a wonderful meeting with it, where we spent three hours together covering the waterfront. You have there people such as the president of the Royal Society, Sir Paul Nurse, so one could not have access to a higher level of advice on science. Then there are the research councils, of course, which are composed of the most illustrious people in their fields. You have the academies, both the UK-wide ones and those such as the Royal Society of Edinburgh, with which I spent some time over the summer. That is just on the science side. On the innovation side, we are very fortunate to have people with great industrial experience serving on Catapult boards, Innovate UK boards and other committees.

There is no shortage of very high-quality advice. I intend, as with this Committee, to take and to reflect on that advice. A Science Minister ought to be well advised. In writing the science and innovation strategy, I will certainly take the advice of all of the people we have been talking to and who have submitted evidence.

Q23 Stephen Mosley: When David Willetts came to speak to us a couple of years ago, he said that he tried to attend the regular weekly meetings that the chief scientific adviser has with the departmental science advisers. Have you been able to attend those meetings as well?

Greg Clark: I am going on Wednesday. I have met some of them individually, but there will be a catch-up on Wednesday at which we hope to talk about the science and innovation strategy.

Q24 Stephen Mosley: Have you met any of the individual Department advisers?

Greg Clark: Yes, I have met them over previous weeks.

Q25 Stephen Mosley: Have you been able to meet any of the scientific advisory committees across Government?

Greg Clark: Some of them serve on different committees of Government. Do you have a particular one in mind?

Q26 Stephen Mosley: One of the first reports that we did looked at scientific advice in emergencies. I was going to lead on to Ebola. Where are the Government getting their scientific advice? How involved are you in that?

Greg Clark: Sir Mark Walport brings together the advice across Government. I probably meet Sir Mark weekly, if I reflect on it. Ebola has been a very significant focus of attention across Government, principally for DFID and the Department of Health. On the research side, I am sure this Committee knows that we are one of the world leaders in finding a vaccine against Ebola. I was able to brief colleagues on the work that is taking

place in Oxford on that. Professor Adrian Hill is leading the research team, which brings together the MRC, the Wellcome Trust and DFID. Healthy volunteers in Oxfordshire are now being tested for the efficacy of this vaccine.

Q27 Stephen Mosley: A week or so ago, there was a bit of to-ing and fro-ing—not so much from yourself as from the Department of Health—on the advice as to whether screening should be introduced for people coming into the country. Where did that scientific advice come from?

Greg Clark: As you know, each Department has its scientific adviser; Sir Mark co-ordinates that advice across Government. It is not for me as Science Minister to intercede with a particular Department—that is why they have the advice. As I understand it, the advice was updated and caused a change in the arrangements.

Q28 Pamela Nash: Welcome, Minister. As far as we are aware, a new science and innovation strategy is due to be published imminently.

Greg Clark: Around the time of the Autumn Statement.

Q29 Pamela Nash: Okay. What can we expect to hear in the new strategy?

Greg Clark: I cannot reveal its entire contents now, since it is coming out in a few weeks—

Q30 Pamela Nash: We always try.

Greg Clark: Sarah Newton did manage to get me to make an announcement to the Committee. She asked me a direct question and I had to give the direct answer, so your questioning is clearly productive.

Let me say a few things about the strategy. It is something that I want to endure—in other words, I want it to take a 10-year forward look. Obviously, it is crossing the end of this Parliament, which means that it should withstand political contention. It should be something that commands the respect of all parties and none, and lays down the arrangements for our approach to science in the future. As I said to the Chair earlier, a lot of that is continuity. The research councils, the funding arrangements we have in place and the principles that we have established—principally, the Haldane principle that Ministers do not direct particular scientific projects—will all be reaffirmed.

There are some themes I want to reflect on. If you are looking 10 years into the future, it seems to me that there is a requirement and a responsibility to reflect on some of the things that we know are changing around us. I will mention just a couple of those. It is evident that there are increasing opportunities and an imperative for interdisciplinary research. This Committee will know very well how, around the world, breakthroughs and insights cannot be contained by particular disciplines that were there in the past. That gives us the opportunity to reflect both on the institutional arrangements—collaboration between institutions and institutes—and on making sure that the funding systems we have in place

recognise the opportunities for funding things that may not fall neatly into one discipline or another. That is one of the things I will want to reflect.

The other thing, with which this Committee will again be familiar, is pace. Take, for example, Ebola, which we have just been talking about. Obviously, it is in all of our interests that, when we make scientific discoveries there, we do so as fast as is safely but humanly possible so that we can get them out and treat people. There is that imperative, allied with the commercial imperative that this is an increasingly competitive scientific world. If we are ponderous in our approaches, there is every possibility that more agile countries may pick up an idea, take it from us and enjoy the prosperity from that.

Those are two of the themes that, it seems to me from talking to the types of advisers that Mr Mosley was questioning me about, should be reflected in the arrangements that we put forward in the strategy. That is what I will be doing. Of course, those arrangements should also reflect the results of the science capital consultation, which we will announce at the same time.

Q31 Pamela Nash: I will not push you much further, although we do always try. Back in the 2013 spending round, there was a commitment to increase capital investment and funding for science and research; you alluded to that at the end of your previous answer. Concerns have been raised publicly, not least by the national academies and our counterpart Committee in the House of Lords, that resource budgets are not keeping up with that capital investment. Can I ask you to comment on that?

Greg Clark: One of my predecessor's achievements was, in a very difficult financial settlement and the difficult financial times we have gone through, to invest in science in the way in which the Government have done. That was a significant achievement. It was not one of the categories that were protected in advance, but the achievement was that we were able to do that. Obviously, the next spending review will be after the election; that will be when decisions are made looking forward. I will take the advice of this Committee and others and argue the case for science.

There is a recognition of the importance of investing in science, resource as well as capital, for us to do well. We have been doing well. In the last few years, we have protected the budget and increased the capital budget. It is worth reflecting on the fact—the Committee knows this but perhaps not everyone outside does—that with 1% of the world's population, we have 6.5% or thereabouts of publications, nearly 12% of citations and 16% of citations with the highest impact, so we really get a lot of bang for the buck out of our investment in science. That will be a case that I will make across Government.

Q32 Pamela Nash: Do you accept the criticism that if research budgets do not keep up that may have an impact on the success of the investment that has already taken place?

Greg Clark: I would be reluctant to accept that as a criticism because I think the Government did well, at a time when they had to reduce Government expenditure—they were elected on a mandate to do that—not only to protect the science budget but to increase the capital budget. That is something that was done well. Behind that is a recognition that investment in science pays off. As we come to the next spending review, I

will make that case as persuasively as I can—with, I am sure, the support of the Committee and others.

Q33 Pamela Nash: I have one final question, regarding the science capital road map. Your predecessor championed—as did the Department—"eight great technologies" and invested in them and in the commercialisation of those. How will they feature in and influence the new road map?

Greg Clark: That is a very good question. I am very taken with the typology that my predecessor produced on that, and I intend to reflect it in the science and innovation strategy. Of course, people can cut it in different ways; other reasonably-minded people might have chosen a different way of formulating the description of the technologies. I want to make sure that over a 10-year period the strategy is open to new developments—I mentioned the importance of pace—that may present themselves during that time. The technologies are a good platform but should not be a kind of prison to restrain us. However, they will be reflected in the strategy.

Q34 Pamela Nash: There are people working on those technologies just now—indeed, in my constituency—who take great pride in the fact that they were chosen. Can they be confident that they will still be championed in the road map?

Greg Clark: Absolutely—they will be at the heart of the strategy. What I want to make sure for a strategy that will endure 10 years is that, eight years down the road, if there is a technology that is nascent at the moment but clearly becomes important, we have the ability to accommodate that and do not say, "Because it was not one of the eight great technologies, we are blind to it." That was never my predecessor's intention and it will not be mine. However, you are absolutely right—it is a strong foundation and will be reflected in the strategy.

Pamela Nash: Thank you, Minister.

Q35 Chair: I want to move on to education. I will not start with a cheap gibe about people who studied at the LSE, because we both did. I am sure we both agree that if we are to get people engaged in science we need to start at a very young age—to encourage them from the earliest possible age. Will the forthcoming science and innovation strategy include plans for capital investment in school science? If not, why not?

Greg Clark: Again, I do not want to pre-empt the publication of the strategy, but I would be very pleased if you would invite me back to look at it and to give your reaction to it. What I can and will say is that I agree with the premise of your question. Science is not something that starts at the age of 18, when people go to university or college, or even at 16, when they are choosing their A-levels, or even when they are choosing their GCSEs—the earlier, the better, frankly. Opportunities to excite and inspire people should be there as early as possible. Many people in science attribute their lifelong interest to a very early stage.

In terms of making sure that people have the competences and learning to be able to go on to careers in science—indeed, in STEM generally—the earlier we can do that, the better. We will reflect that in the strategy, with colleagues in the Department for Education, reflecting the cross-Government approach to this. This will not be a BIS strategy—it will be a Government strategy. All of the relevant parts of Government are being involved in it.

Q36 Chair: We have probably had more tension between this Committee and some of our Government witnesses in this area than in any other, on issues ranging from future funding for the National Schools' Observatory—which is still on your desk, by the way; we look forward to an answer on that, although I shall not push you for one today—through to the work we have done more recently on A-level practicals. I realise that that issue is not entirely in your bailiwick, but you will no doubt have some influence on the process. We were told by the previous Minister that there were no alternatives—and that Ofqual had deemed that there were no alternatives—but we believe we have now demonstrated several legitimate alternatives, which we will be publishing soon, backed by a very wide range of scientific opinion at the highest level. Can we have some assurance that Government will listen to that and think carefully about driving through changes that are driven not by science but by bureaucracy?

Greg Clark: As you know, the curriculum and the exam system are not my responsibility. I think that it was Ofqual that made the decision; it was not even a ministerial decision. However, from a meeting that I had with another of my advisory groups—a cross-industry STEM advisory group—I know that Gatsby, for example, is doing some important research work on this that it will bring to bear on Ofqual and others. I and, I am sure, my colleagues at DFE will be interested in the Committee's report, and it will merit a serious response. I would be misleading you if I were to speak for and to pre-empt them in an area where I do not have the decision-making power, but I will certainly look very closely at your report.

Q37 Chair: For those who are not aware, it will not strictly be called a report—it is governed by the Parliamentary Papers Act 1840, which stipulates that reports must be on paper, and we are going to do it on film. There you are—we are pushing the boundaries of definitions.

Greg Clark: As you might expect the Science and Technology Committee to do.

Q38 Graham Stringer: I do not know whether you are familiar with the last triennial review of the research councils.

Greg Clark: I cannot say that I have read every one of its 400 pages—

Q39 Graham Stringer: Well done for getting the number of pages right.

Greg Clark: As you know, it was published before I took office.

Q40 Graham Stringer: My point is not to test whether you have read what is a long document but to ask whether it was worth doing something as long and detailed as that. Is it a good use of civil servants' time? As you mentioned previously, a lot of the decisions are governed by the Haldane principle, which means that the Government stay at arm's length from them. Do you not think that it has been a bit excessive?

Greg Clark: Certainly I would observe that it is a long report, but it would be a bit mean for me to reflect that the people who have worked hard on that, including people from outside the public service who have worked on it in a voluntary capacity, have not done so with an intention to be rigorous and comprehensive. It is right that you should have these triennial reviews and that you should not simply roll forward everything that we acquire. I do not want to join you in criticising that when it has been the product of some sincere and hard work.

Q41 Graham Stringer: It is right that all parts of Government should be accountable—nobody is going to question that process—and that it should be done in a transparent way, but research councils are a bit different. It took 15 months to produce the report and basically it said that everything was A-OK: that the functions performed by the research councils are still required and that they should be "retained in their current form"; that the current balance of costs against benefits does not support a change; and that individually the seven research councils are "operating from a position of strength". You have to take a look at it, but I would like you to reflect on the fact that quite a lot of civil servant, bureaucratic resources were put into that, which may have been excessive, for the results.

Greg Clark: I will reflect on it. The result endorses broadly the arrangements that we have, which have been successful. I mentioned how the impact of UK research has been disproportionately effective, so it is not as if we are inquiring into a set of arrangements that has failed the country—rather the reverse. If there is a reluctance to throw everything up again and start from the beginning, I can understand that.

Q42 Graham Stringer: Changing the subject back to something that has been touched on, while there are great scientific universities in the north of England and the regions doing absolutely world-class, groundbreaking research, outside the universities, investment in science research is disproportionately in the golden triangle of Oxford, Cambridge and London. That has been exacerbated by the investment in what one hopes will be a world-class facility, the Francis Crick Institute in north London. Do you have any views on whether it is the Government's job to have a fairer balance of investment in science across the country?

Greg Clark: You will know that no one is more committed than I am to making sure that every part of the country prospers, not just the south-east. That is the work that I have been doing with cities across the country and with the regions. Our reputation in science is based on excellence, so we need to make sure that we are funding excellence but recognising the actual and potential excellence in places outside London and the south-east. In response to the unexpected question from Sarah Newton, I mentioned that we are investing nearly £100 million in Exeter for a high-performance computer supporting the Met Office. That is a good example of something that is world beating. The reputation of the Met Office is global but it is in Exeter, not in what you have described as the golden triangle.

The investment in graphene in your home city, Mr Stringer, reflects the fact that you had a Nobel prize winner demonstrating excellence. We were fleet of foot in making sure that we could invest in that. I have been part of many discussions with the N8 universities in the north of England. In response to the increasingly collaborative nature of the best research these days, they are putting things in place and building on arrangements that they have to increase their collaboration so that they can be competitive with the collaborations that already exist in London and beyond.

What I observe is that there is a great determination in the cities and areas outside London to compete vigorously and head to head with London, Oxford and Cambridge. They are increasingly well organised and able to demonstrate that excellence. It is not a question of favours—they are competing on their merits. I expect that to be reflected in increasing success, as we are seeing.

Q43 Graham Stringer: Can I move on to marine conservation areas? I know it is not primarily your responsibility to sort those out, but the way the science interacts with the policy making is. This Committee has been concerned that the process of declaring them has been much slower. I may not get these words quite right, but the emphasis in declaring marine conservation zones has changed from the best available science to a much tougher category, which essentially leads you to do more research until people are satisfied with the current level of the science. First, are you familiar with that area? Secondly, will you take a look at it to see whether you think the process of applying scientific knowledge is being done as well as it could be or whether too much is being asked of it, and whether it could be speeded up?

Greg Clark: In the last few weeks that has not been at the top of my inbox, but I will certainly take an interest in it. I will perhaps write to the Committee and to you, Mr Stringer, and take heed of what you have said.

Q44 Graham Stringer: I am not trying to catch you out—it is just an area the Committee has been interested in. Similarly, the next question is also about an area the Committee has been interested in. We are sponsoring a debate in Westminster Hall on Thursday afternoon on communicating climate science. I have asked previous Science Ministers, advisers and all sorts of witnesses what their definition of climate change is. I would be grateful to hear your definition of climate change.

Greg Clark: I do not have a technical definition. Did you say "climate change" or "climate science"?

Q45 Graham Stringer: Climate change.

Greg Clark: I understand climate change to be the observed changes in the climate that, empirically, seem to me to be pretty well known in the scientific community, supported by theory that would predict that the climate would change. That combination of the empirical side and the theoretical side seems to me to come together.

Q46 Graham Stringer: My final question is even more left field. When C. P. Snow was Science Minister, he said that to be educated you need to know the second law of thermodynamics. As you went to one of the world's leading universities—if not the leading university—for science and are now the Science Minister, even though you did economics, can you tell us what the second law of thermodynamics is?

Greg Clark: I am not going to be tempted down that path, Mr Stringer, but it is a nice question.

Q47 Chair: You will be glad to know that my granddaughter, at the age of four, was reciting a nursery rhyme that is about the laws of thermodynamics, but there you are.

Greg Clark: Clearly, you have been a good influence on her.

Q48 Chair: No, that is her parents. One thing just before we finish: this Committee has been interested in horizon scanning. One of our key witnesses, Jon Day, was very clear when he was asked whether the silos of Government create obstacles in horizon scanning. With the straightest civil service answer I think I have ever heard, he said, "Yes." Do you recognise that? What are you doing about it? How are you going to take forward this new, cross-cutting responsibility for the horizon scanning programme?

Greg Clark: I think it follows from everything that I have said. I am someone who absolutely recognises that the way government is organised in Departments, which is administratively necessary—you cannot have a single Department; you need to have some kind of order to it—runs the risk of creating silos, so that people talk to one another more within the Departments than they do outside. That applies to pretty much every area of policy, as far as I can see.

The purpose of horizon scanning should be to overcome that and to do so in a deliberate way. From talking to Sir Mark Walport about this, I know that it is a particular priority of his to make sure that that is done as effectively as possible, notwithstanding the division of Whitehall in that way. He will have my full support and partnership in trying to discharge, in that important role, the approach that I have described to you of not recognising the constraints of particular Departments but seeking to operate as a Government.

Chair: Going back to Graham Stringer's point, Minister, I refer you to the Flanders and Swann song, to recite the next time you are here. Thank you very much for your attendance this afternoon. The Committee will now go into private session.