

HOUSE OF LORDS  
MINUTES OF EVIDENCE  
TAKEN BEFORE  
THE SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY  
**SCIENCE POLICY AND GOVERNMENT**

TUESDAY 13 JULY 2010

RT HON DAVID WILLETTS MP

Evidence heard in Public

Questions 1 - 34

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TUESDAY 13 JULY 2010

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Present

Broers, L  
Crickhowell, L  
Krebs, L (Chairman)  
Rees of Ludlow, L  
Selborne, E of  
Wade of Chorlton, L  
Warner, L  
Winston, L

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Witness: **Rt Hon David Willetts**, a Member of the House of Commons, Minister of State for Universities and Science, Department for Business, Innovation and Skills, examined.

**Q1 Chairman:** Minister, thank you very much for coming to meet with the Select Committee for this session. We very much appreciate you fitting us into your busy diary in your first period in office, and we look forward to a conversation over the next 70 minutes or so about various matters that we wish to ask you about. I should mention for members of the Committee, yourself and members of the audience that, as usual, this session is being web-streamed but, in addition, it is being televised, so the cameras are recording us for TV. Also, the House of Lords photographer is taking flattering photographs of us at various suitable intervals during the session. In welcoming you here I would also like to thank you very much for your letter that you sent me last week, in which you have alluded to the Government response to our report that came out just before the election on priorities for science funding. You did say to me that you were hoping to get the response back to us very soon, and we would certainly appreciate it if it came in within a reasonable time before the House rises on 28 July. So that would be most helpful to us. I would like to remind members of the Select Committee of the importance of declaring any interests that are relevant to the evidence session before you speak. Minister, you have indicated you would be willing to make a short

opening statement, and I would very much like to offer you the chance to say a few words before we lead into the questions.

**Mr Willetts:** Thank you very much indeed, my Lord Chairman. Thank you for the opportunity to come and meet this Committee. I understand the importance of responding to the excellent report that the Committee produced in its previous incarnation; I hope now that response will not just be very soon but very, very soon. I just wanted to say, in my very brief opening remarks, that I want to apologise in advance, because there will be many questions which the Committee, understandably, wishes to put to me and ask me about where the comprehensive spending review makes it very difficult at the moment to give authoritative answers. So I wanted to explain and apologise for that in advance. Many questions that are understandably of concern to the Committee are still being considered by the Government. However, I hope the Committee might also see that as an opportunity, because it does mean that the issues, points and concerns of the Committee can be fed into the consideration of the Government's public spending plans. So, equally, there are some upsides as well as some downsides. I am completely in the Committee's hands on any particular points you wish to pursue.

**Q2 Chairman:** Thank you very much indeed. Perhaps I could kick off with the first question, which is really to ask for your account of the Government's view of the role of science and technology in delivering key policies for government, and also in securing economic growth. We have heard a number of political leaders referring to rebalancing the economy to an economy based on high-tech innovation and manufacturing, referring to science and innovation as the ladder out of the recession, and I wonder if you could give us your view of how that is going to play out in the coalition Government's thinking.

**Mr Willetts:** Yes, we do attach a lot of importance to science and technology, and it comes in several different forms. First and most wide-ranging, there is the importance of evidence-

based policy. I have to say, my Lord Chairman, I think that the very fact of working as a coalition has been very good for evidence-based policy. Cabinet Committees and the Cabinet itself function very well, and there is a lot of discussion, challenge and questioning of evidence, which I think is good for government. As well as the way in which the coalition Government functions, we have tried to strengthen as well the importance of scientific advice and scientific perspective in government in a new revised Ministerial code putting in an explicit reference to the importance of following the principles of good guidance and advice between scientific advisors and Ministers. So that is one important area. The second important area, of course, is science and technology as a contribution to a rebalanced economy. There we have, fortunately, several excellent reports which we are considering at the moment, as well as the report from this Committee in the previous Parliament. We have also had Hermann Hauser's report to Lord Mandelson and Sir James Dyson's report to my party when we were in opposition. There are some quite interesting areas of overlap between those documents. A particular area of overlap is what I think we could call, perhaps, the German or the Fraunhofer Institute question – whether there is a case for technology institutes that act as a bridge between the more pure research perhaps done in universities and the point at which commercialisation and venture capital gets involved. We have already held in the department a very useful series of meetings on ways in which we might be able to apply that model in Britain, though of course this is inevitably subject to all the obvious public expenditure constraints. A third area where we are also drawing on the importance of STEM, and it is the importance of the themes drawn up in the excellent Royal Society report, is the recognition of the importance of investing in the STEM infrastructure, in the broadest sense of the word, both high-grade training and education of young people in STEM subjects, and we attach a lot of importance to encouraging more study of STEM subjects in school. You will have also observed that in the 10,000 extra places for university we have expressed a

very clear preference that they should be in the STEM area, but as well as the human capital there is the physical capital as well as the importance of infrastructure, and there are people here today who have reminded us of the importance of investment in infrastructure as we look to future challenges such as climate change. So be it in evidence-based policy or in the importance of scientific advice or the particular agenda on Fraunhofer institutes, or more widely a commitment to STEM, the Government is committed to recognising the importance of science and technology in everything we do.

**Q3 Chairman:** Thank you. In the previous Government there was a long-term plan, a 10-year science and innovation investment framework. Is it envisaged that the coalition will develop a similar long-term plan? I do think it is very important for the scientific community to know that there is an element of stability and a longer-term vision.

*Mr Willetts:* This is a point that many people make to us, and it is, of course, subject to the way in which our discussions go in the CSR. There are, clearly, very strong arguments for a stable, long-term framework within which the science community can plan. I very much hope that as we emerge from the CSR - though the negotiations are going to be very tough and there are no special protections for spending in BIS - at the end of the day, we will be able to offer a stable environment within which the scientific community can plan.

**Q4 Lord Rees of Ludlow:** I first declare an interest as President of the Royal Society, which has provided written evidence to your department, particularly to Adrian Smith. One concern which we have is the status of the so-called ring fence which the previous Government established and, indeed, maintained. I would like to ask what you would see as the status of such a ring fence and what would be inside it.

*Mr Willetts:* Those are two very good questions. As I said, we do want a long-term stable framework for science spending. As to the exact form that that takes, the explicit ring fence

and the amount within the ring fence - and also, of course, the exact period - are all subjects of the CSR, but the letter which the Royal Society sent to Adrian Smith in June in the run-up to the Budget was very helpful in explaining the very strong arguments in this area, and those arguments are well understood as we work on the CSR.

**Q5 Lord Rees of Ludlow:** Just to follow that up, of course, the volume of funds within the ring fence is crucial. I realise it is difficult for you to make any firm statements, but is there anything you can say regarding the likely content of the ring fence and the extent to which the research councils will be constrained in the way in which they expend the money within that ring fence?

**Mr Willetts:** There will be a process in which, both in the run-up to CSR and after the announcement of the totals, in October, there will then be an allocation between the different research councils of whatever the budgets may be. We do understand the importance of giving the research councils a longer-term framework (the 3+1 that they attach a lot of importance to), and so I very much hope that, even if we emerge from the CSR with levels of expenditure that are less than the scientific community would hope for, at least we are able to provide some stability. I am sorry that I cannot add more on that, at the moment, but it is a new Government with a new public spending exercise, and without any inherited long-term plans overall on the CSR I hope the Committee will understand that it is rather early to be getting into the specifics. However, I very much understand the points that have been made by the Royal Society on a range of occasions.

**Q6 Chairman:** You yourself, Minister, have recognised in public statements that our competitor countries are investing heavily, even in a time of recession and reduced public expenditure. Will that thought of international competition be factored into the discussions leading to the CSR?

**Mr Willetts:** Yes. I think I would say there that there is, of course, that international challenge, and we observe, for example, that recently two very significant teams of scientists were recruited by Canada. I do understand that issue, absolutely. I would just say that, of course, in the modern global economy there is always a two-way street, and there are, endlessly, both scientists going from the UK to study abroad as well as scientists from abroad coming to study and research in the UK. What I hope we can do is advance beyond the language of competition and also think about co-operation. I am very pleased that when the Prime Minister leads a delegation to India the week after next that will include people from universities and scientific research, and one of the strong themes we are trying to develop there is co-operation between us and Indian research institutes and bodies with a shared commitment, for example, on tackling some big issues in medical research. So we see what other countries are doing, and it is not just a competitive challenge but, if we are smart and diplomatically astute, opportunities for us to collaborate with them more closely. I hope that the Committee will see when we return from India, depending on how things go, some quite imaginative examples of that.

**Q7 Chairman:** I welcome that thought; nevertheless, India, for example, will have a choice of many nations to collaborate with, and if we wish to remain a desirable collaboration partner we have to have a strong investment strategy ourselves. Would you agree with that?

**Mr Willetts:** I completely agree with that.

**Q8 Lord Rees of Ludlow:** Just to follow up that point, one aspect which concerns many of us is that we do depend on a fluid international flow of talent, and in the last two years the competitive position of the UK, as perceived by people in third countries, has fallen compared to the US, Canada and other countries. We are a less attractive destination for mobile talent, and I worry that if it is thought that science is less well-supported in this country than in those

other countries we would not only lose the influx of mobile talent that we have achieved over recent years but, also, we will send a negative signal to the next generation who will feel that the UK is not a country in which they can do world-class science or technology. So it is a concern that even a modest decline in funding will be perceived as a signal that the UK is falling from its very strong position, and that will affect mobile talent at a senior level, outstanding graduate students from abroad and, also, the career choices made by young people. I wonder how you would respond to that.

**Mr Willetts:** Those are all very fair and important arguments. I hope it would not be too impertinent, my Lord Chairman, to suggest that one thing that might be helpful, in some ways (a reversal of the conventions) is that if the members of this Committee, with the expertise of the members of this Committee, have empirical evidence of these effects - hard figures, estimates that are robustly based - then I and the department would be very interested to see them, because they clearly are very relevant considerations, and we are at the stage where the more of this kind of evidence that we can consider would be very useful as part of the CSR process.

**Q9 Chairman:** That is a very welcome challenge, and we will follow that up. Could I just ask one small supplementary question on this? There has been discussion in some quarters of a move to reorganise the structure of the research councils, and some people have talked about moving to a national science foundation or reorganisation of ESRC and AHRC, with reporting lines for MRC and so on. Is there anything you would like to say about these rumours?

**Mr Willetts:** There are various rumours like that floating around. My instincts are that, at the moment, when we have real decisions to make about public spending and priorities in science, we do not need as well a further set of research council reorganisations. This may come up on the agenda, but all I can say is, for the moment, neither the Secretary of State nor

myself have any specific proposals for reorganising the research councils. We are bombarded with proposals for merging them, separating them off, reconfiguring them in some way or other, but we are not, as yet, persuaded that there is any particular alternative structure that is massively superior to the one that we have inherited.

**Q10 Lord Warner:** Respecting your constraints under the comprehensive spending review, perhaps I could move us to a process issue around that. When we did our report on setting priorities for publicly funded research we were concerned about the vulnerability of R&D budgets in departments in the tough expenditure round. We were particularly concerned to find there was no individual in government who had an overview of all public spending to support research. Against that background, how do the Government intend to ensure that departmental cuts to spending do not fall disproportionately on research? Who is responsible for taking some kind of overview of the implications of spending cuts across the piece, and who will be assessing the implications of cuts in departmental spend for national capability in terms of research?

**Mr Willetts:** Our starting point is, of course, that that aspect of science and research spending is indeed under the control of individual departments for them to serve the policy purposes of that department. So the lead does rest with the individual spending department. They will, obviously, be looking therefore at their R&D priorities as part of their own individual departmental CSR negotiations. However, of course we do understand the importance that you do need an overview as well, and I can tell the Committee that only this week Sir John Beddington, the Chief Scientist, has had a very useful meeting with the Treasury in which he has raised this issue and the importance of getting a kind of crosscutting analysis of the implications for science and research that follow through from individual departmental negotiations. We are optimistic that as a result of that meeting there will be some kind of crosscutting analysis as well. Secondly, although it is perhaps rather an informal way of

doing this, I have been very encouraged by the weekly breakfast meetings which the Chief Scientist has with the chief scientific advisers across Whitehall. I believe that this is an innovation that predates the Government (I think they have been going on for a year or so - I have been fortunate if I have been able to attend two or three since becoming Minister for Science), and they are creating a very strong sense of a cohesive identity amongst the scientific advisers to government, where the individual chief scientific advisers do compare notes on these types of issues. So although the lead on R&D is with individual departments I think there are genuine attempts at ensuring we have crosscutting analysis as well.

**Q11 Lord Warner:** I think that is very encouraging, but has that cohesion been of any help in finding out what has happened following more than £6 billion worth of cuts that have happened already in terms of their impact on science R&D across the piece?

**Mr Willetts:** So far, we believe that the initial cuts exercised have had a relatively minor impact on science and R&D. Departments were told to protect frontline services, and we think that it has been possible to find savings without doing the damage which you are concerned about.

**Q12 Lord Crickhowell:** In our report, to which we have referred, we talked about the desirability of this kind of expertise being carried into the Treasury. I wonder if you could comment. It does seem rather important, at the moment, when we are having this spending review, that the scientific matters are understood and dealt with in the Treasury.

**Mr Willetts:** I think the point was well made in the report from the Committee. I think it is a very sensible proposal. Perhaps, at the moment, proposing an extra member of staff in the Treasury – it may not be the best moment to win that particular argument, but I think in the long run it is what we should do.

**Q13 Chairman:** Meanwhile, one of the suggestions we made in our previous report was that Sir John Beddington, as Government Chief Scientific Adviser, should be involved in discussions with the Treasury, and you have indicated that at least a start has been made in that direction.

**Mr Willetts:** Yes. If I may say so, I think some of the proposals in the report were rather ambitious in that I do not think that the Treasury. In the gory business of the immediate public expenditure negotiations, were necessarily going to have the Chief Scientist present at every meeting. However, Sir John Beddington has been into the Treasury, and I believe there is a proposal for a follow-up discussion, so there is a real effort going on to engage and make sure that this very important crosscutting issue is considered as part of the spending review.

*The Committee suspended from 3.45 pm until 3.55 pm for a division in the House of Lords*

**Q14 Earl of Selborne:** Thank you, my Lord Chairman. Perhaps I should start by declaring an interest as Chairman of the Foundation for Science and Technology. Minister, could I just remind you that in your last answer you were telling us that you thought that the cuts so far had had only a minor impact, but clearly there is every prospect of larger cuts in the pipeline. Presumably, an assessment will be needed of any potential impact of future such cuts in funding, including the allocation of funding to HEFCE, and that impact would be, surely, on the quality of both teaching and research, and, indeed, on the likely impact on matching funding from industry. Have the Government any intention of doing such an impact assessment?

**Mr Willetts:** As part of the conduct of the CSR negotiations there is very close communication between my department and both HEFCE and the research councils so that we are endlessly testing options: if such-and-such a saving were made, what would its impact be for HEFCE spending; how might it have an effect on research councils? So there is a continuous flow, just as, at the moment, we are preparing a kind of opening letter for the

Treasury, which has to be in by the end of the week, and we obviously draw on the expertise of HEFCE and the research councils in preparing that. When we have got a final decision from the CSR, instead of these discussions being speculative, we will then need to send out very clear authoritative guidance both to HEFCE, as to what its budget will be, through the grant letter, and also to the research councils.

**Q15 Earl of Selborne:** Would you accept that if there are to be such cuts it will have an impact on inward investment from business into research establishments in this country as well?

**Mr Willetts:** There is that risk. All I can say is that we are doing our best to minimise that risk, and one of the ways, as we look for savings, in which we are trying to prioritise areas of expenditure is precisely their contribution to the economy and the role they have in generating matching funding - or, sometimes, multiple levels of funding from other bodies as well. So we are aware of that issue and it is certainly in our minds as we consider the CSR.

**Q16 Earl of Selborne:** Will there be an exercise in continually monitoring the effects? Clearly, an original impact assessment is one thing but monitoring thereafter is a rather different exercise. Will that be undertaken as well?

**Mr Willetts:** Yes. After this we will need to keep a very close eye on the implications of decisions. These are decisions that have absolutely not yet been taken but we are well aware that, sadly, there will be some very tough decisions to take, and there is going to be, very likely, a significant reduction in the BIS budget, and we will do our best to ensure that those cuts are done as carefully as possible. Of course, we should not forget that sometimes these public spending pressures can drive innovation and can lead people to think of new ways of doing things, more cost-effective ways of doing things. You mentioned teaching: there may be other ways in which high-quality teaching can be secured even without the levels of

funding that the universities might hope for. So we are doing our best to be smart. We do not see this as entirely a defensive operation; if there are ways in which we can do things better and more innovatively we are very keen to give that a try.

**Q17 Chairman:** Could I ask a supplementary there? If there is to be pain in the university sector, which will impact upon research through the QR money from HEFCE, does the Government have a view about how that pain should be spread across the sector? I must declare an interest as a member of Oxford University. There are those who argue that if there is to be pain it might be important to preserve the highest quality research institutions in universities and, therefore, offer some degree of protection to a certain number of places.

**Mr Willetts:** I would accept, my Lord Chairman, that when times are tough that does strengthen the argument for concentrating in the areas where there are the highest levels of research excellence. Of course, that then opens up a lot of questions about how you define areas of research excellence, and that may be individual world-class departments; that may be in universities that are not, in general, research intensive. However, I think that the premise of your question is valid; that when public spending is tight it does tend to drive, probably, some further concentration, yes.

**Q18 Lord Broers:** How do the Government intend to ensure that current as well as future scientific advances are translated effectively into benefits for society and the economy? You mentioned the Hauser report, the Dyson report and the Fraunhofers, and you have also mentioned this, I think, in your speech in the Royal Institution. I declare my interest as chairman of the Diamond Light Source, but that is one example of how we have concentrated our efforts from around the country and centred them in one place. However, that has not been our normal mode of operation, and I would be interested in your thoughts as to how that might be implemented in other subject areas where we would need to concentrate a great deal.

Perhaps a related question is to what extent is supporting innovation an objective of public procurement? In the States, in particular, they often focus their military expenditure on the support of infrastructure technologies such as micro-electronics.

*Mr Willetts:* On your first question, this goes back to the issue of public expenditure, and perhaps I can give an example, if it is not too invidious. One area where we are already making savings is in the area of the Regional Development Agencies. There was a tendency for each RDA to have their own R&D projects. I think the figure in my head is that we ended up with 22 nanotechnology centres, most of which were below critical mass. The decision to abolish the RDAs and bring in both local economic partnerships and, also, to shift some of their responsibilities up to the TSB is an opportunity for us to say: “Look, we cannot really afford 22 nanotechnology centres; we have to be more ruthless in concentrating on fewer facilities.” I think the tough times are going to lead to some of that kind of decision-taking. If you ask for an example that would be one that springs to mind. On your second question, I am very much impressed by the evidence on the role of public procurement. Quite a lot of people say that as well as thinking of venture capital investment in new, innovative businesses and grants to new, innovative businesses, we should not forget just the case for contracts to buy their products, which is, as you rightly say, one of America’s strengths. We certainly are looking at that. There is a £220 billion public procurement budget. If we could just use a tiny fraction of that as imaginatively as the Americans do, it would be a real contribution to innovation.

**Q19 Lord Crickhowell:** In your Royal Institution speech you spoke about procurement and mentioned Skynet, and you talked about clusters, and so on. As a former President of Cardiff University I was pleased that, in talking about creating links between university and industry, you cited the example of Cardiff producing the Spectral and Photometric Imaging Receiver for Herschel and Planck, and cited that as a combination of scientific research and

technological advance creating dynamism. I spent quite a lot of time when I was Secretary of State for Wales trying to create those industry/university links. You went on in your speech to say that you see it as one of your tasks to strengthen these links. I immediately wrote in the margin "How?" I wonder if you would elaborate a little. Having spent quite a lot of effort trying to do it in the past, I am particularly interested in how you set about it.

**Mr Willetts:** That part of the speech, if I may say so, was shamelessly lifted from Lord Rees's Reith lectures, where he deployed the argument that we often think of scientific advance leading to technological advance but sometimes it is technological advance that makes scientific advance possible. I guess that, particularly, astronomy is a very good example of that. As to how we make this happen, this is where, again, the Fraunhofer Institutes, if we were able to go down that route, could play a role, but, also, the concentration of facilities in clusters where both (if it is a useful term to use) pure scientific research and also applications are developed. What is happening at Harwell, I think, is a very good example of that, where there is a deliberate attempt to use Harwell as the core of a cluster of activities. I was pleased that, I think, only last Friday a new IT facility was opened there. So we are very keen on physical co-location, which is what has happened at some of our most research-intensive universities but could happen in other ways as well, and perhaps will happen at CMRI. That is one way in which we can make this happen and, again, it is where, as the RDAs are replaced by LEPs, I do think there is, if we are smart, an opportunity also to be a bit more rigorous about creating some serious national clusters.

**Q20 Lord Warner:** Can I come back to this issue of public procurement? This is a real old chestnut, which we go over periodically, about every five to ten years. The core problem is that whilst BIS is always in favour of this, what you actually find in reality is that it has no capacity to ensure that departments actually pursue that agenda. A classic example is a department I have been in, which has a big budget, which is the Department of Health, which

is notorious, in the NHS, for its poor take-up of innovation. I am just wondering how you are going to make some of this stuff stick, if you really want to drive public procurement as an instrument of backing innovation and the translation of R&D.

*Mr Willetts:* On that example, all I can say is that I have already had a very useful meeting with Lord Howe, and he very much takes the point you have just made, that the NHS itself can do more to move rapidly to absorb new advances in medical technology, for example, and we are trying to work together on this, because you are right that, I guess, the NHS is probably the largest single example. However, we are also trying to work on this agenda with the Cabinet Office, which is very keen on being smarter in public procurement. I do not claim this is a new problem and I do not claim any unique wisdom in solving it; all I can say is we are putting our energy in trying to do rather better.

**Q21 Lord Winston:** One of the issues is this translation into the benefits for society. Of course, what we all recognise is that sometimes the public perceives not necessarily only benefits but, also, dangers to society. I think, to some extent, it is fair to say the last Government did quite a bit to try and promote public engagement activity, particularly the activities of things like Sciencewise, with its dialogue programme. I just wondered whether these relatively inexpensive things, where they can be supported by government, would, in your view, be worth continuing to be supported.

*Mr Willetts:* Those sorts of dialogues are very worthwhile. There is a rather uncomfortable example and then a better example: GM is, clearly, a very uncomfortable example, and we very much regret the two departures from the exercise that Sciencewise was trying to host in getting a dialogue going on GM. We have to decide what to do next there; that is an issue that I discussed with my colleagues in the Department of Health and in Defra. We have not yet made an announcement, but we are trying to work out what is the best way forward in these rather difficult circumstances. A better example is synthetic biology, where we have

(and I think the research councils can be congratulated on this) done some useful work in getting a dialogue going and getting some feedback from people. Even when Craig Venter went for some, perhaps, rather lurid or ambitious claims (and there are people round this table who are far better able than me to assess exactly what he did and what the significance was), the fact that we were able to fall back on some quite serious work that had already taken place on dialogue on synthetic biology meant that, so far, reaction has been more measured than what happened with GM.

**Q22 Lord Wade of Chorlton:** First, I should declare an interest as chairman of the RisingStars Growth Fund Limited, which is a technology fund for new start-up tech companies in the north west of England, and I am also chairman of a company called Rocktron Ltd, which has an innovation environmental technology. I want to ask you the question: are the Government committed to evidence-based policy? If so, how will they take forward their agenda and ensure that policies are properly evaluated and lessons learnt from the process? I must admit that you answered a lot of that question in answer to the first question on looking at the science issues. I am going to broaden the question a little bit because on the issues that you are outlining, which is how we can use new technology and innovation to create wealth (that sums it up), there are a lot of other issues than the scientific issues; it is how you actually do it and how you actually get companies to get involved in new technologies; how we provide the finance. So I was wondering whether your evidence-based policies will look at those issues for best evidence, not just for science-based at the beginning but how you drive the process right through to actually getting products into the marketplace.

**Mr Willetts:** That is a very fair point. The new coalition Government has just produced our programme and that involves a host of policy initiatives, and we do understand the importance of continuing to evaluate them. You do need measures of success - and indeed in this very area of R&D, industrial development and applying ideas from our universities you

need measures of success. The trouble is designing measures of success (and, again, this is an area where the Committee can assist and advise us) that do not themselves distort behaviour. I must say that as we look at the evidence in the departments, I am rather concerned that, I believe, excessive weight has been attached to the number of patents, for example, as a measure of the performance of university research labs. You can end up with a university spending a sizeable part of its budget protecting rather middle-ranking kind of patents with neither the money to really take them forward, but spending money to protect the patent, and I personally (and we have not resolved this) think that probably the “patent test” now suffers from exaggerated weight being given to it, and it has distorted behaviour. We need to be a bit smarter in measuring the process all the way through the technology readiness levels right through to full commercialisation. We are trying to get away from that rather crude benchmark to something a bit more sophisticated. This is early stages and (it is for Members of the Committee to decide) it might be something on which the Committee could advise us.

**Q23 Lord Wade of Chorlton:** I was interested in your response to Lord Warner’s question about how do you actually get a different procurement policy within very large organisations, and you said that you had a word with Lord Howe about it. I have launched a lot of different products in my life, and the one lesson I learnt early on is you do not get new products into the marketplace by talking to the boss; you get new products into the marketplace by talking to the buyer and the customer of the buyer, so that they know that there is a new thing on the market. What I am saying is that in order to get new products into the health service the people that matter are the people in the hospitals who are buying the products. Somehow this is, to me, an example where the whole issue of how we actually turn new ideas from universities, from research, which is second to none, into commercial products, which is a weakness in the UK, is based on an understanding of that chain and all the issues within it.

**Mr Willetts:** It is a very valuable point, yes, and I am sorry I did not fully understand the point made before. That is a fair point. Of course, there is this dilemma in the NHS: it is both a national organisation and it is also a set of individual hospital trusts or purchasing bodies - be they GPs or Primary Care Trusts. I completely take the point; there are direct relationships with individual hospitals, and I accept that.

**Q24 Chairman:** Could I just return, Minister, to the point about evidence-based policy? I am looking at the report that was in *The Times* around a month ago in which you were quoted as saying that "... Ministers should be free to reject advice for political reasons, it was important that decisions were founded on evidence and research when possible". I wondered what you meant by that. Politically possible or possible in terms of the amount of evidence available? What do you do if it is not possible to base your decisions on evidence?

**Mr Willetts:** I have to confess to this Committee that politics is not a completely empirical activity.

**Q25 Chairman:** It comes as a surprise to us!

**Mr Willetts:** It is a shock, I know! There is more to political activity than simply collecting evidence and then deciding what to do. Political parties are elected with programmes; they are elected because of the character and beliefs that those political parties have, and the electorate expect a degree of predictability and some values and principles to lie behind what the different political parties do. They do not expect us to be in a sort of permanent seminar, waiting for the evidence. So there is a point at which an elected politician is entitled to say: "These are the values and principles on which I was elected and I have a democratic mandate to advance them." The second thought that was behind what I was quoted as saying (and it is an analogy that I have used before) was that being a Minister is much more like being a GP than being a hospital consultant; you are operating on a limited amount on information, in

limited time, you cannot always wait for the extra evidence from the biopsy, because time passes and things have to be done. So, for all those reasons, we are never going to reach what is sometimes set up as the perfect model of evidence-based policy. What I do hope we can develop, and it is what the new rules on ministerial conduct are about and the principles of scientific advice, is a relationship of trust between Ministers and the scientific advisers and the other expert advisers who are advising them. I know there has been some suspicion in the scientific community when I use this word “trust”, but it seems to me to be manifestly a good thing. It means that people have to be able to feel free to give their advice frankly and, also, Ministers have to be engaged and willing to listen to that, but equally there has to be a recognition that a Minister has a distinct set of responsibilities including to the pledges that he or she made to the electorate. It is very early days, but, so far, those types of relationships are working. What we have also set out, I think more clearly than before, is a kind of appeal procedure if these relationships are in danger of breaking down, involving both the Chief Scientist and myself as the Minister for Science.

**Q26 Chairman:** Just to re-emphasise that last point: if there were a breakdown the Government Chief Scientific Adviser would be involved in discussions about that issue?

*Mr Willetts:* Indeed. I hope that he would feel able to involve me - the Minister might himself or herself wish to involve me - and, ultimately, it could go up to the Prime Minister.

**Q27 Chairman:** I do not think any of us who have been involved in scientific advice would be naïve enough to assume there is a linear relationship from science to policy, for all the reasons you have described, but in light of recent events under the previous Government, I think it is a very strongly held view of the scientific community that when decisions go against the advice Ministers should be prepared to explain in a very open way why they

ignored the scientific advice, particularly if the evidence is compelling for a certain course of action, which is ignored. Would you agree with that approach?

**Mr Willetts:** Yes, I think that is a very understandable desire for the scientific community. I agree with that.

**Q28 Lord Winston:** Minister, it is a very long question which will take at least two minutes! I declare an interest as a member of Imperial College of London, with a spin out company from innovations, a member of the Engineering and Physical Sciences Research Council and the Scottish Scientific Advisory Council. I recognise that you probably would agree with me that scientists cannot predict the future. Therefore, the question I want you to try and address is how do you think we should research impact - how can this be assessed and used to try and prioritise funding, particularly for our future wellbeing?

**Mr Willetts:** This is a very important issue. There is a lot of interest in this whole subject of impact. It breaks into two parts. There is, of course, the research council's role in assessing impact prospectively, and, also, there is the role in the REF, as will be, in assessing impact as well. Very briefly, there is not a requirement (because I do understand there are concerns in the academic community about this impact agenda) for the research councils that scientists predict exactly the impact of their work. There is an expectation that they try to describe a kind of pathway in which their research may have an impact. When it comes to the REF there are some genuine concerns about the proposals for measurement of impact, and those concerns are both about whether it is methodologically sound, whether they have actually got an agreed way of doing it and, also, for me, as I see my role as partly reflecting the views of the academic community, I was not clear there was a consensus about the impact. For those two reasons I have asked HEFCE to delay by a year the implementation of the new REF so that we can see whether those two challenges of getting a measure that is methodologically sound and one that commands the consent of the scientific community can be satisfied.

*The Committee suspended from 4.23 pm until 4.33 pm for a division in the House of Lords*

**Q29 Lord Winston:** Minister, you drew the interesting distinction about retrospective assessment of impact. For example, it is almost the 50<sup>th</sup> anniversary of the invention of the laser, and we are still learning actually what the laser can do for us. We are presumably going to make a molecular microscope soon, but it was a very long time before it was used in communications (many years after the patent after the invention); its use in the gene sequencing machine was about 30 years later, its use in nuclear fusion in California is quite a lot later and, again and again, it takes a very long time for our most important inventions, I think, to be appreciated. So, in a sense, the assessment of the impact seems colossally difficult.

**Mr Willetts:** That is an argument that many scientists put to me, and I think it is something that I very much hope and believe the research councils are aware of as they conduct their pathways to impact assessments and, also, HEFCE has to be aware of as part of the REF, because – you are absolutely right – there is no point in trying to invite a scientist to make predictions in which they have no confidence: the last thing that scientists - especially scientists, who are so committed to their academic integrity - wish to do is to invent future potential uses of their research in which they do not really have confidence and which they cannot really know about. The pathways to impact, I am assured by the research councils, invites researchers to speculate about what could happen rather than inviting them to commit themselves to a specific impact. Similarly, if we are able to resolve the concerns about the REF, it will be because there is a methodologically sound way of assessing at least some impact over what could be a 20-year timescale of an academic's research career. That is exactly what I have asked HEFCE to go back and look at further, because I do not think they have, as yet, resolved those issues.

**Q30 Lord Broers:** Just as a final comment, because it is related to what I want to say, things are not the same as you look across the science spectrum. As an engineer I have absolutely no worry about impact; if engineering researchers cannot talk about their impact they should not be doing the work they are doing - is my feeling. You can work on very basic things, that is my point. What I really wanted to bring out is that the bigger problem, I see, in setting up Fraunhofers is going to come from the industrial side. We have got to get industry to commit to that sort of centre and then to put very good people in it and, really, play the key role that they have to play. In so many industries – I do not mind whether we are talking about Rolls Royce turbines or certainly things like iPods – you are using a series of established technologies in a very sophisticated way, and that is what you expect to get out of Fraunhofers as well. More products evolve from earlier versions of products than come out of the blue sky. So I am particularly concerned there, because I think that the universities actually do a very good job here, but the interface is not always the problem of the universities. We have got to get our industries committed to doing the advance work. We do not talk about that so much; that is why I want to bring it up, just to get your view.

**Mr Willetts:** First of all, on your comment on impact, I do detect that there may be some disciplines that are more relaxed about impact than others, which prompted me to ask the question: could you have an REF which had an impact assessment for some disciplines but not others? I was advised quite strongly that people did not want to go down that route, but, again, that is something else that the Committee may wish to reflect on. So far, I am working on the basis that people would prefer one shared methodology rather than saying that you could do it in some disciplines but not others. That is another interesting question which we have now got an extra year to think about. On the Fraunhofers, yes, I think there is a limit beyond which you cannot expect a university to get into development and commercialisation, and you cannot expect a scientific researcher necessarily to be an expert on how to

commercialise what they are doing, and they may not even be aware of the potential applications of what he or she has discovered. There is no reason to expect that they should. Part of the success of the Cambridge cluster of sites is that there are three or four technological consultancies which specialise in trying to work out and identify applications of ideas from Cambridge scientists, and you cannot expect a scientist necessarily themselves to see all that. There are places in Britain which do appear to overcome this, either at the cluster level, like in Cambridge or (I have not yet visited but am very keen to visit) the Advanced Manufacturing Centre, I think in Rotherham, which you may be more familiar with than I, where I am told that you have got leading firms, including Rolls Royce, coming together and using it as a base for the development of their products. So it sounds, from the accounts I have had, as if that could be a kind of proto-Fraunhofer, but I want to go and check it out.

**Lord Broers:** I would agree with that. Rolls Royce is the shining example of how to do this, but I think other industries are not as strong.

**Q31 Lord Rees of Ludlow:** Could I ask one final question? I mentioned at the beginning my concern that X per cent cuts would have a more than X per cent effect on the amount of high quality work being done here. I would like to ask what answer I should give when, as often happens, I try and persuade a young person to go into science or a distinguished foreign scientist to come and work in the UK, when they look at the headline figures that are projected here and compare them with the headline figures regarding other countries' scientific investments.

**Mr Willetts:** There is still in Britain – not still – we can be very proud of our open, inventive, empiricist tradition. As well as the well-equipped laboratories and facilities, I think that the intangibles of the atmosphere, the spirit of inquiry and the vigorous debate in learned journals and in academic societies is a great strength. It is one question for a foreign visitor who wants to come and do research here; there is separately a sort of scientific career issue, and that is

something else that we do need to get to grips with. To be honest, I think it is one of the issues that the scientific community needs to address – the exact structure of the scientific career path – and it is an example of a problem which is, to some extent, disguised in the good years, when you have got very rapid growth. However, you cannot have rapid growth forever; these are models that have to last through the tough times as well as the boom years, and my view is that there are some quite tough questions about the future structure of the scientific career which inevitably arise and are thrown into sharp relief as soon as the very rapid growth in public spending comes to a halt, as it inevitably has to. That is something else where, again, I hope, working with the scientific community, we can think about what a sensible and sustainable structure for scientific careers should be. I think the health service went through this a few years back when they were recruiting everyone on the basis that they were going to become a consultant and suddenly realised it was absolutely impossible that all the people they were recruiting were going to become consultants, and they needed to think about other satisfying positions to reach in a career and other opportunities for people to do. I do think that is going to be a big challenge for the scientific community over the next years, revealed by a tougher public expenditure regime but inherent in the world that we have inherited from the good years.

**Q32 Lord Wade of Chorlton:** Following on from that, would you agree that the opportunities for science and new technology are not just going to be in existing large companies but, if we are going to make a success of it, we are going to have to produce a lot more scientific-based companies. We are going to have to encourage new businesses coming forward that will make use of science and scientists as well. It is not a question of saying to new scientists: “You must look for jobs in existing large organisations”, like Rolls Royce; you have to create a lot more of them over the next four or five years. Do you agree with that?

**Mr Willetts:** Yes. This is something that, of course, in BIS we are very much involved in, and my reading of the evidence is that we have got some big successful firms, like Rolls Royce, but we have also got quite a high rate of start-ups and lots of new companies being created; it is in the middle where we are weakest - the equivalent of the German mittelstand; it is the medium-sized businesses. It is getting a company from being a small, bright-eyed, start-up to being something that is quoted on the Stock Exchange to carry on, that is viable and not immediately snapped up by something very large. Those are the kind of companies that are, maybe, too small to have their own R&D department and probably do not know enough about how they can draw on the research capacities of universities in the area, and they may be people who have not set foot inside the local university, where devices like the innovation voucher can really help. If anything, my view is it is the middle-sized companies that are the biggest single weakness in our industrial structure.

**Q33 Chairman:** Minister, I would like to thank you very much indeed for this session. Thank you for your patience during our brief excursions to obey the division bell, but, also, thank you for your openness and willingness to respond to questions; we very much appreciated that. We also recognise, as you said at the beginning, that the story will unfold during the CSR process over the early part of the autumn, and I very much hope and expect that our conversation will continue as the picture becomes clearer. We have been very encouraged by both your openness and the clarity of your responses, even if you have had to be frank about the difficult financial times that lie ahead. If there are any other points that we have not covered that you might wish to make we would be very happy to either hear about them now or have a follow-up in writing. If you do wish to write to us that would be helpful.

**Mr Willetts:** We will review the evidence and if there are any points we wish to add or amend in any way, of course, I will take up that opportunity. Thank you very much.

**Q34 Chairman:** Thank you. Of course, you will receive a copy of the transcript for correction in the usual way. At that point, I wish to draw the proceedings to a close and thank you, once again, for coming to speak with us.

**Mr Willetts:** Thank you very much.