The science budget : minutes of evidence / Science and Technology Committee.

HOUSE OF COMMONS SESSION 1999–2000

SCIENCE AND TECHNOLOGY COMMITTEE

THE SCIENCE BUDGET

MINUTES OF EVIDENCE

Wednesday 25 October 2000

Lord Sainsbury of Turville, Minister for Science

OFFICE OF SCIENCE AND TECHNOLOGY
Dr Martin Earwicker and Ms Jo Durning

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MINUTES OF EVIDENCE

TAKEN BEFORE THE SCIENCE AND TECHNOLOGY COMMITTEE

WEDNESDAY 25 OCTOBER 2000

Members present:

Dr Michael Clark, in the Chair

Sir Paddy Ashdown
Mrs Claire Curtis-Thomas
Dr Ian Gibson
Dr Brian Iddon
Mr Robert Jackson
Dr Lynne Jones
Dr Ashok Kumar
Mr Ian Taylor
Dr Desmond Turner
Dr Alan W Williams

Examination of Witnesses

LORD SAINSBURY OF TURVILLE, a Member of the House of Lords, Minister for Science, and DR MARTIN EARWICKER, Director, Science and Engineering Base Group, Office of Science and Technology were further examined. MS JO DURNING, Director, Transdepartmental Group, Office of Science and Technology, was examined.

Chairman

1. Lord Sainsbury, welcome, once again, to the Science and Technology Select Committee. You are no stranger to this Committee. We are always pleased to see you and we are always grateful that you have time to accept our invitation whenever we make it. Would you care to introduce your two colleagues to us?

(*Lord Sainsbury of Turville*) On my right is Martin Earwicker, who is the number two, under John Taylor at the Office of Science and Technology in terms of the Research Councils and Jo Durning who is from the Transdepartmental Science Team, under the Chief Scientific Adviser.

2. Dr Earwicker, we have welcomed you here before, I think in January of this year, nice to see you again. A particular welcome to somebody we have not seen before, Jo Durning. Minister, I think what we will do is we will direct our questions to you, and if you think it is appropriate to ask your colleagues to comment or to take the whole question, that is entirely up to yourself.

(*Lord Sainsbury of Turville*) Thank you very much.

3. Lord Sainsbury, we were, of course, delighted to see the increased funding for science as a result of the Spending Review 2000. Do you think there is still further to go if we are to become a world class player in science research in this country?

(*Lord Sainsbury of Turville*) I would like to say we are, of course, a world class player as far as science is concerned in terms of the results of what we do. We have quite an outstanding record for scientific discovery. In terms of the resources we put in, as far as this particular spending round was concerned what we did was to look at what money we could reallocate within the programmes, ie where there were areas we thought were no longer hugely profitable areas to fund and how we could transfer that money into new areas which were important. When we had done that we still found there was a very significant gap in some of the new areas which we wanted to fund and that was the basis of our proposals to the Treasury for funding. I think, as you said, the settlement we got was an extremely encouraging one. In terms of the percentage of money which is funded by Government for research, we do not do too badly. I think there is still some scope to push that up in the future to the sort of level we would like to see.

4. I think, if I recall, the budget went up to 2003, we are talking about the next three years. It was loaded ten per cent in the final year. Would you want to continue that sort of spending on science, beyond 2003/2004? Would it be your intention to try and push for that same level of increase year by year?

(*Lord Sainsbury of Turville*) One would want to argue it on the basis of what we feel needs to be funded. I think there is still an enormous amount of very good scientific proposals to be put forward which we do not fund, although the percentage is not very different from the situation in America. There is still good science which could be funded. If you make that comparison with other countries, which one thinks we should be in a comparable position to, then I think one would almost certainly be arguing, again, that there should be a significant real increase at the end of this period.

5. When any Government money is found, whether it is the Health Service or Education or Science, money is an input. It is the output that we are after. You could say the inputs are precursors, but without the inputs you cannot get the outputs. It is really the outputs we want rather than inputs. What outputs are you seeking from these cash inputs? How can you measure them in this rather difficult field?

(*Lord Sainsbury of Turville*) The output we looked at is in terms of really two major criteria, one is in terms of scientific discovery. I think the metrics which are used here, which are in terms of the scientific papers produced, and then the citations of scientific papers by other scientists, are good metrics for measuring the quality of scientific discovery. On those metrics we, as a country, do outstandingly well. If you then take those metrics and look at them in terms of the resources we put in, we probably do

[**Chairman** *Cont*]
better than any country in the world in terms of scientific discoveries per million pounds of input. What I think we need, first of all, to do is make certain we maintain that remarkable record of discovery, in terms of the excellence of the science. There is another set of metrics which is about the innovation which stems from that Science Base. There we are developing more metrics, from this spending round onwards, in terms of the sort of things you would expect from the universities or public sector research establishments, which is the amount of licensing income, the amount of spin-offs and the amount of research income which comes from the industrial side. There the metrics are not at all clear, because there have not been consistent records. We would like to have metrics in those fields which were comparable to good American universities.

6. Your Department, or somebody in your Department, are measuring these metrics you talked about to the best of their ability, it is not relying on somebody else; it is being measured in-house?

(*Lord Sainsbury of Turville*) There are very good statistics—across the world on these citations—and we keep track of that. As I said, on the knowledge transfer side they are not good metrics and we are putting in place surveys, so that in the future we can get this on a regular basis. I think I should have said the third thing we would be looking for is the flow of trained people coming out of the universities to go into industry.

Dr Gibson

7. The joint Infrastructure Fund has disappeared as such and a new infrastructure fund has been set up. Can you share with us some of the thinking on why that is necessary, and if this will be continuous for a period of time? We all got a shock, indeed, because of the extent we need to invest in this area. At the same time, could you tell us how these sums of money are arrived at? Is there a strategy in applying for the future?

(*Lord Sainsbury of Turville*) I think the JIF fund was done on the basis of a sense that we were really facing a period of crisis as far as our scientific infrastructure was concerned. We put in a very large sum of money quite quickly without having, necessarily, a very good feel for the scale of the problem. Since then, of course, we have had the bids for JIF, we have had a flow of proposals from universities, only a proportion of which we could fund. That gave us a good indication of the scale of the backlog that we were facing. In the run up to the Spending Review I chaired a cost-cutting review which looked at this and we tried to estimate the size of the problem. It was very big, indeed. I think the billion pounds we are putting in will go quite a long way to recovering that backlog. I also think one of the things you will notice about the way we are putting in the money is that we will be quite clearly having a stream of funding which is for capital, that this will go to be allocated to universities on some basis and the decisions will then be for them as to how they use that money. I think what is very important about this is that they will not, however, be able to use that money for things other than for capital expenditure. What a lot of the problems stem from was stopping a division between capital and revenue in this case, which meant that the universities under pressure very much under-invested on the capital side.

8. If I can chase you about the mechanics of it, will the old projects, that were well starred and well respected that could not be funded, all have to be re-submitted again or do you start with the old bids—what then?—and the new ones come in and they will be looked at in five years' time? How is it going to work?

(*Lord Sainsbury of Turville*) The Wellcome part of the money will be used, to a certain extent, to cover the backlog of the projects they had under the JIF competition. For the rest of it we will be making allocations to universities and they will be making their own decisions about their priorities for what they want to do.

9. How will you decide on the allocations to universities?

(*Lord Sainsbury of Turville*) We have still to decide on the details of that, but broadly it will be in line with the kind of requirements they have in terms of the research that they do both for industry and for the research councils.

10. Could you say how the research councils and Wellcome and any other organisations will work together and avoid duplication of research efforts? It could turn out possibly that a building was funded twice.

(*Lord Sainsbury of Turville*) I think there are procedures which eliminate projects which have already been funded for being put forward as proposals. I do not think that is a requirement. There is obviously a loose coordination about this. I think we want to get away from people in the centre trying to micro-manage the capital expenditure of universities and get to a system where universities set their own priorities on these things.

11. Is there a percentage of thinking that you give them all the money and the research councils do nothing, just spin it around?

(*Lord Sainsbury of Turville*) This part of it was in terms of the capital. On the revenue a different set of principles apply.

12. What about universities in Northern Ireland and Scotland, for example, will they benefit from HEFCE infrastructure money?

(*Lord Sainsbury of Turville*) No. Remember here there are two different things. When we are talking about HEFCE money we are talking about money which is for England. When we are talking about the Science Budget we are talking about United Kingdom money, and you have to take these two in those different frameworks.

Mr Jackson

13. Lord Sainsbury, you made a reference to this impending decision about how the money will be allocated to the universities. You referred to work with industry and other criteria. Would you agree with me that the fundamental purpose of government spending on science, at least your

[Mr Jackson *Cont*]
spending as opposed to departmental spending, is to spend on the kind of work that industry will not support, because it is too long-term, or too open, or too speculative? Do you agree that that is basically the objective?

(*Lord Sainsbury of Turville*) In terms, yes. The basic money we are providing is for those parts of research which are not obviously funded by industry, yes.

14. Does that not mean that the primary criteria for the allocation of funds to universities should be in line with the intellectual value of the proposed research, rather than co-operation with industry, which should be encouraged, of course, but that could lead to the danger of the Government funding activities which industry should be expected to fund?

(*Lord Sainsbury of Turville*) As I say, we have not finalised the criteria we will do for that. I think you could say that in terms of the work universities do do, one would simply want a measure of the amount of research they do. If that biased it to encourage universities to do more with industry, I personally will not be unhappy with that situation.

Dr Gibson

15. Scotland will not have the HEFCE allocation that the English have?

(*Lord Sainsbury of Turville*) They have their own funding council.

16. Will there be infrastructure money in that?

(*Lord Sainsbury of Turville*) The SHEFCE money does the equivalent thing in Scotland for that.

17. Within the notorious Barnett formula or something like that?

(*Lord Sainsbury of Turville*) I think it is for them to make that allocation themselves.

18. Fine. My last question is, why is all the money not channelled through the Science Budget? Why do you not put it all in one pot and allocate it?

(*Lord Sainsbury of Turville*) The dual funding system is one of the things that people feel very strongly about.

19. The Science Budget?

(*Lord Sainsbury of Turville*) The basis of the funding of science is that there are two streams. There is a research council stream and there is a HEFCE stream. People feel, and I would agree with this, that there is some considerable merit in a system of funding which has some diversity in it and it is not simply channelled through one funding stream, which may get some of the decisions wrong. There is some merit in a diversity which is built into our dual funding system.

Dr Turner

20. Lord Sainsbury, I am still a bit in the dark about how the allocations are going to be made, and you made it clear that you have not finally decided yourselves. Will you be taking reference to RAE scores and the normal performance indicators, or will you be using a different criteria?

(*Lord Sainsbury of Turville*) The decision to be made is that we want to very clearly allocate this money rather than have challenge funds for it, and we want to be absolutely clear that this is used only for capital investment. Other than that, we still have to make the exact criteria for how we do allocate it.

21. Will you use peer review as part of that process?

(*Lord Sainsbury of Turville*) Those are the decisions that we need to make on this. The question, I think, is more to do with the quantity of research which is done by the university, because what one is trying to do is underpin the research which is being done with the infrastructure to do it.

22. You have already been asked how you arrive at the numbers. Are you satisfied that the amounts that you have identified as the infrastructure fund will, in fact, plug the gaps that lie between us and international standards of infrastructure?

(*Lord Sainsbury of Turville*) I think that with the sum of money that we have been given, which is very considerable, we should then be able to basically take the infrastructure we have and bring it up to the sort of standard we would want to see, yes.

Mr Taylor

23. You make an interesting point here about allocation. Of course there will be tremendous demand on infrastructure from every university and HEFCE might be thought to have some responsibility for every university. As the Science Minister that is not your responsibility, your responsibility is to make sure that the best science is done in the very best places, and that means you have to target it. So there is a bit of a contradiction between HEFCE and the Science Budget in the way that infrastructure is allocated to reinforce scientific excellence. How do you deal with that?

(*Lord Sainsbury of Turville*) I think the primary consideration is always, of course, the excellence of the science, but it is not the only criteria. We are also interested in the question of innovation and knowledge transfer, and, of course, the money we are talking about is not only underpinning the world-class science, it also has a role in underpinning innovation and knowledge transfer as well. I would not accept the principle that the only criteria for the scientific infrastructure is, in fact, the quality of the science. Though when one is talking about research, clearly that is the sole criteria.

24. I accept that caveat and the beauty of the fusion of the OST and the DTI was in order that knowledge transfer and innovation could feature more highly. My point, nevertheless, is that one of the criticisms that might be argued is that Britain is slipping behind in its international bench mark high quality research, rather than the volume of research we do. In order that that should not be an accusation that can be upheld, it is vital that a disproportionate amount of this money goes into centres of research excellence. I was really looking for your assurance that that is exactly the objective that you have.

(*Lord Sainsbury of Turville*) First of all, I do not think there is any evidence at all to show that there is any slippage on the excellence of the scientific research we have done. On the contrary, I think it is

[**Mr Taylor** *Cont*]
an extraordinary record that it has continued at the level it has, in terms of quality. I think that is the starting point of this. I think there is an underlying trend, which we looked at, which says that the amount of money allocated through the research councils is on a concentrating trend, if that is clear. In other words, simply by allocating it on peer review through the research council is tending to concentrate it in fewer places, as you might expect. I do not think we should be taking any decision which says that we try and concentrate it further or more than what actually happens as a result of peer review taking place. So, as I said, I think it is in the centres of excellence. If anything, that trend is increased. As I say, also, we are now talking about capital investment, of course, the research council money is done largely on peer review, capital expenditure on wider criteria.

Dr Turner

25. Can you explain the thinking behind the requirement for universities to find 25 per cent of the infrastructure costs from elsewhere, especially given the fact that alternative sources like Wellcome are already committed to the venture, and part of the 75 per cent allocation? Are you expecting to look to other charitable trusts or to industrial funding?

(*Lord Sainsbury of Turville*) Yes, or their own internal sources as well. That is simply to make certain that in making these decisions people do not say: "We have the money and therefore we will spend it". They are always aware of the fact they have to provide a portion of it. I think that makes it a bit tougher before they make these spending decisions.

26. Do you not think this is loaded in favour of traditional universities that have long established financial resources of their own—obviously Oxford and Cambridge come to mind, but not exclusively them—and younger universities, which may have established a reputation for scientific excellence, do not have access to those sort of resources? Are you not loading the dice rather?

(*Lord Sainsbury of Turville*) I think a lot of the new universities have established very good relationships with industry. That is one of the other major sources of money for this. In some cases if you look at the amount of research that universities do for industry it is not the same list as if you look at it under RAE criteria.

27. That still seems to me to be loading it in favour of traditional universities because they also have equal opportunities to have good relationships with industry and extract money, probably better.

(*Lord Sainsbury of Turville*) I think it is always a bad thing to say: "We will give you the money and you do not have to find any of this". We do want to make it a rather tougher criteria, where people do have to say: "Where does this really stand in our priorities?" before they go ahead with this.

28. Is this going to mean that the type of institution or project that gets funded is going to depend less on the quality of the scientific work in that institution than on the institution's administrators?

(*Lord Sainsbury of Turville*) I do not think so. I think what it will do is make universities just that bit more careful about whether they go ahead with the project. I do not think you will find that much of this money is returned because people cannot use it, and find the twenty-five per cent.

Dr Jones

29. What is the justification for twenty-five per cent as opposed to ten per cent or fifteen per cent?

(*Lord Sainsbury of Turville)* In some sense it is arbitrary in that it could be fifteen or thirty-five. One was trying to make a judgment of something which is enough to say to people: "Do not go ahead with this project unless it is really one of your priorities". On the other hand, we are not stopping good projects because there is not the possibility to fund it.

30. You are confident that twenty-five per cent as a contribution will not put off any institutions?

(*Lord Sainsbury of Turville*) In doing this cost-cutting Review we did actually talk to universities about this point and say that we were thinking of a figure of this size. They did not object or say that this was an impossible situation. We did, in fact, informally consult them on this issue. The team of people who made the study actually visited a lot of universities, put this proposition to them and we did not get any strong reaction saying: "This makes it impossible".

Mr Jackson

31. Moving on, on the subject of infrastructure, to the very welcome £100 million that has been set aside for research council laboratories and national facilities, in my constituency there is Appleton Laboratory. Could you tell us how you reach the figure of £100 million? I wonder if it is enough. What kind of projects do you expect it to support? Would any of this money be going for the new Synchrotron?

(*Lord Sainsbury of Turville*) There are two issues here, one of which you will be very familiar with. In setting up CCLRC it was never given a proper funding stream to ensure that it could plan for the future, so every major project has been a one-off situation. One of the things we had in mind was to correct that situation. The second is that the public sector research institutes have been allowed to get into really lamentable condition. We felt we needed a sum like this, to enable us to have funding for CCLRC and also to begin to repair the situation on research establishments. I do not think we could say firmly this will do all of the work that is required on either of these two streams but it is a better start than nothing, which is what we had in the past. As far as the Synchrotron is concerned, those figures are already built in to the underlying figures.

32. Thank you very much for that answer. Does this mean that you expect the fund to continue beyond the Spending Review period?

(*Lord Sainsbury of Turville*) I think not to have a stream of capital funding either for CCLRC or for the research institutes has to be wrong. Like any research establishments they require capital investment to keep them up-to-date, indeed in some

[Mr Jackson *Cont*]
cases to repair the roof and stop it leaking. There should always be an underlying stream of capital investment for public sector research establishments. With CCLRC the same argument. There are constantly new machines being developed and they should be funded on a proper basis.

33. Who will decide about the allocation?
(*Lord Sainsbury of Turville*) This is for the Director General of the Research Councils.

Dr Kumar

34. Lord Sainsbury, you have generously allocated £252 million for high priority new science programmes. You have also identified three areas, genomics, e-science and basic technologies. I wonder if you can share with us how did you identify these particular areas as high priority? How would you allocate this particular money to the research councils?
(*Lord Sainsbury of Turville*) We did it through very significant consultations between the Director General of the Research Councils and the research councils themselves. Of course they also had advisory bodies. Ultimately it is the judgment of the Director General of the Research Councils as to what the major areas are where we want to put new money into. Of course they are fairly broad categories and encompass quite a lot of areas of research where we have to do more work. Broadly they are the kind of areas which the feedback we got from the research councils were saying; these are areas of great scientific opportunity on the one hand, and also, in all three cases, they are of very considerable long-term commercial importance.

35. Will there be any strings attached when you allocate this money? How would you measure the output and the success of these new programmes?
(*Lord Sainsbury*) I do not think there are any strings attached other than the money must be spent on the area that we allocate it to. We will use this money very much as cross research council money. In one case we will probably put it into a single pot, which any research council will manage, and then other research councils will bid into that money. Perhaps in other cases we will allocate it to research councils, but then put in mechanisms to coordinate it across the research councils. We do see this very much as multi-disciplinary type work which will go across a number of research councils. We will assess the quality of it in the normal way, through the Peer Review and the papers and citations that flow from it.

Dr Turner

36. Lord Sainsbury, can I ask you to go back to the question of how you got to the sums in this case? Here you have a very wide-ranging field; you have yet to determine how to divide it between the research councils. What is the rationale behind the estimate that you have come up with?
(*Lord Sainsbury of Turville*) It is obviously a judgment as to the size of these areas and where the priorities lie. We assess the priorities lie in those three areas, having, of course, done the previous work, which was to look within our own resources and see what we could do by reallocation, because obviously the fundamental base is that you do not go on funding areas of research which are no longer really leading edge, and transfer that money into new areas. So the first thing to do was to do that, and after that to look at, with the Chief Executive of the Research Councils, what their priorities were and try to put this together as a package which we judge to be our best size.

37. Do you think that this will now enable the funding of more Alpha plus rated projects than before?
(*Lord Sainsbury of Turville*) Yes, I think that, given that the money is a substantial increase in real terms, one would like to think one could do that. If this leads to more Alpha projects coming forward because people think they get a better chance of getting them funded, one could not guarantee that the percentage will go up.

38. Have you factored in the cost escalation of that work?
(*Lord Sainsbury of Turville*) No, I think a lot of that comes in any case on the capital side, rather than the revenue side of this. We have not put into that a figure which says this is a rate of escalation on the costs.

Dr Williams

39. In identifying priority areas, will there be a contingency fund in case there are new priorities that emerge in the next two years or year three?
(*Lord Sainsbury of Turville*) Within this the money is allocated to research councils. We would expect them to keep the new money within the areas. Of course, they have, within the other allocations, considerable scope to put the money into what they regard as the priorities as they go along.

40. You list three or four of the priority areas. I notice that sustainable energy never seems to feature as a priority area, despite climate change and the Prime Minister's speech yesterday and so on. Why is it that renewable energy is not a priority?
(*Lord Sainsbury of Turville*) The areas that we give here are not simply priority areas, they are areas where we want to put extra money in, because we already put quite a considerable amount of money into renewable energy, and quite a lot of that also comes from sources other than the research councils. I think within the funding we have we can deal with those problems.

41. In the Science Budget overall the increase next year is 5.8 per cent in real terms, the following year 5.5 per cent and then in year three of the CSR it is 10 per cent. Congratulations on the very high numbers, higher than education or the health service. Why is it that it is loaded so heavily in year three? Is that by your request or is it because of allocations?
(*Lord Sainsbury of Turville*) That is a question for the Chancellor. We would very happily have taken it in the first year. It makes some sense to build up and give oneself some time, but I think that is more to do with the overall settlement.

Mr Taylor

42. I hope that you are not going to use the funds just to boost the Prime Ministerial speeches. That is short-term science.

(*Lord Sainsbury of Turville*) I think just next week's speech would not be a sensible way to do it.

43. Particularly as I remember nano-technology was getting about £20 million back in 1996/97. That is one of the areas that is long-term before you get results. I was just wondering how you selected this. I was delighted that you talked about multi-disciplinary research, because that often does fall down the plug hole, and whether it is right or wrong that people do feel that it is not recognised even when it is Alpha, and that will require co-ordinating. Were the subject areas decided by the Chief Scientific Adviser after a good breakfast, or do they come out of the Foresight Programme, or is it a thing that you have taken a personal interest in as Science Minister? How does it come out?

(*Lord Sainsbury of Turville*) It does come from a sensible process of consultation with the research councils, and they also have mechanisms for consulting both on the scientific side and with the user communities. I think it is those processes which are rightly the biggest input to these kind of decisions, though, also, Foresight does play a part where it is quite clear that a technology is developing very fast. If you take the three areas, I do not think you would find, if you looked across the world, that there would be any great divergence of views of those major areas of development. There might be a slight emphasis with putting more on the basic technology bit and a bit more on the e-science, because we see real opportunities in these fields. I think they are fairly common areas where new money is required.

Chairman

44. Lord Sainsbury, the Science White Paper placed a welcome emphasis on the Government's programmes for encouraging innovation and the exploitation of science and, indeed, an extra £80 million was found for the Higher Education Innovation Fund, but we understand that that comes from the Science Budget and that would tend to imply that it is the Office of Science and Technology that will be managing this third stream of money, rather than the Funding Council. Is that correct?

(*Lord Sainsbury of Turville*) The HEROBAC (Higher Education Reach Out to Business and the Community) Fund, which was its predecessor, was always very much a joint effort between the DTI and HEFCE, and we would want to continue that, though in this case the money did actually come through the science side. I think that is because we want to make certain that there is a real scientific input into that stream of funding. We very much want to engage the science community in this kind of knowledge transfer. I think it is saying you want a very strong science input to that stream of funding.

45. This stream of funding is replacing HEROBAC and some of the others, which you were saying did come from the Science Budget anyway. So this is not a diminution of the responsibility of funding councils, it is a continuation, perhaps for a larger sum of money, of a system that applied before?

(*Lord Sainsbury of Turville*) Yes. Before the money essentially came through HEFCE and then we made an input to it. Their stream of funding continues at the same level and an additional stream of funding is brought in from the Science Budget on top of that. So it remains very much a dual source of funding with us. The extra and rather larger sums have come from the science budget.

46. Is there any shift in emphasis? Is there an attempt for the OST to become more dominant as a result of this, or is there no shift of emphasis, or is it marginal?

(*Lord Sainsbury of Turville*) I think it is making certain that we do fully engage the science community and the scientists in this kind of work, and that it does continue to have a very strong science knowledge transfer basis to it.

47. How will this new Higher Education Innovation Fund be pertinent in Scotland, Wales and Northern Ireland?

(*Lord Sainsbury of Turville*) In this particular case the science money will have to be on a United Kingdom basis, the HEFCE money will have to be on an English basis.

48. As you explained before in response to a previous question on this side?

(*Lord Sainsbury of Turville*) Yes.

Dr Jones

49. Lord Sainsbury, at the beginning you said that one of the deliverables that you wanted to see was a flow of trained people. Have you any view on the long-term requirement for PhD-trained individuals, and are you satisfied that we have the policies in place to achieve those numbers?

(*Lord Sainsbury of Turville*) Yes. I think it is all very difficult to know what the requirement figures of this are, because, of course, a proportion of the people who do PhDs do go into other jobs which are not directly science-related.

50. I see that that is one of the requirements.

(*Lord Sainsbury of Turville*) I think it also is a good thing if people with a strong science background and excellent training are going into the economy at large. If you say: "No, we are not interested in that", you can say, of course, we have enough, we are filling all the jobs for scientists, because we have a lot of people who come out of science and go into other things. I think it is very difficult to know what the ideal number of PhD students should be. What I think is the key requirement is that we keep up the quality of those and make certain that the quality remains very high.

51. You did say that one of the parameters was the flow of trained people, so surely you must have some assessment of the requirement into the economy in general, and not just into science? Are you not concerned that the research councils are having great difficulty, particularly in engineering subjects, filling

[**Dr Jones** *Cont*]
research studentships? Are the measures that are put into the budget adequate to deal with that problem, or do you see it as a problem?

(*Lord Sainsbury of Turville*) I think it is a problem for us. As a whole, the position is pretty good. There are one or two areas where we are probably not seeing enough PhD candidates coming through. Those are mainly areas where there are very attractive jobs being produced by the industry, which are attracting people to go into them. That is why it is so important that we did increase the stipends for PhDs, and equally important why we give universities more flexibility about what they actually pay people. There are areas like economists or computer scientists where the demands and payments which industry are prepared to make are huge. We have to make certain that we keep an underlying strength in the disciplines in those areas.

52. The increase to £9,000 is not until 2003. £9,000 is better than £6,000 odd, but it really is a very small amount of money. You pointed to the competition for the services of these individuals; is this really adequate? Are you not really worried about this?

(*Lord Sainsbury of Turville*) As I said, overall we get the numbers. There are some key areas. I think it is very important there is more flexibility. Where there are areas where we cannot get people we can do more. In terms of the historical record it will be over this period a major real increase to the stipends. It is worth bearing in mind—I got the figures out for those meetings—that in 1997 the figure was, in real terms, almost exactly the same as it was in 1967, ie all that happened over that period was that inflation had been taken account of. In real terms there will be a 23 per cent increase. A 23 per cent increase over this period, in comparison with almost a static real figure over 30 years is at least, I think you will agree, a move in the right direction.

53. It is still static to 2003.

(*Lord Sainsbury of Turville*) It goes up steadily over the period.

54. It goes up to the princely sum of £9,000 by 2003.

(*Lord Sainsbury of Turville*) It goes from £6,620 to £7,500, £8,000 and £9,000. It does go up steadily over that period.

Mrs Curtis-Thomas

55. I am delighted that there has been some shift. I have to tell you I think it is quite an abysmal amount of money that we are offering PhD students. From the number of inquiries that this Committee has undertaken where we meet research students and we talk to them about how they feel about their remuneration and how they feel about their work I suspect—I am hoping most of my colleagues would agree with me—the amount of remuneration falls far below anything that they realistically expected and it does not offer an inducement for them staying in research. We know that the salaries for researchers are equally low. Having recently been abroad and spoken to students in the Hong Kong University, they receive £38,000 a year. For that they attract high calibre individuals, they keep them out of industry and they keep them in research, because they want to retain them. I am not at all satisfied with the proposed increase of £9,000. I think that it is having a significant effect on attracting students into academic research, particularly in the areas of medical research, where we hear we are desperately short. I would really like to go back to the question and say that putting an extra grand on a year certainly does not furnish a research student in a home. There has to be further money allocated. When you say you have given some latitude to universities, what does that actually mean in terms of hard cash? As somebody who started a PhD research programme, I had to quit because there was not enough money to keep me there. Come on, Lord Sainsbury, when are you going to put your hand in your pocket? These are our people of tomorrow, and we desperately want to keep them in place. Why should we say to them: "You must stay there for £6,000 a year"? It is just obscene.

(*Lord Sainsbury of Turville*) That is why we have moved it up 23 per cent in real terms over three years.

Dr Jones

56. 23 per cent of nothing is not a lot.

(*Lord Sainsbury of Turville*) I would not want to defend this as being princely earnings for people to do this kind of research. I have to say, I think as you move up to this point, over that point, you could make a very strong argument that that does not become the overriding priority. The next priority I would have is some of the people who are doing junior research jobs.

Dr Turner

57. It is a tough barrier for them. They are going to go through three years of real financial hardship; we are talking about the cream of students here, and then as a reward, at the end of that, when they have their PhD and they get their fellowship they are still paid a pittance. This is a terrible disincentive. No wonder they get creamed off by industry very quickly into all sorts of non-science areas.

(*Lord Sainsbury of Turville*) Yes. I have to say I do not start with the assumption that anyone who comes out of the research establishment and goes into industry is somehow a loss to the country.

58. These are non-scientific related.

(*Lord Sainsbury of Turville*) One of the things we want to encourage is that people do see that working in all sorts of jobs can be a very fruitful use of their skills. I think that the other consideration, I have to say, is we have a flow of excellent people in most of the areas who will go on doing this kind of research. I think, of course, for all of these people, by most standards, we would all want to pay them more. The question is which are the priorities. I think there was a real priority to make a major step change at this level. I think there are some other priorities as well.

Dr Gibson: While we are having a go at you, the people that teach them and show them the skills get bad wages too. The future academics and the people who do the research and publish all the high-flying genomics research—

Dr Jones

59. Why should they all be fighting amongst themselves? We need to do something for all of these people. The level of remuneration is really appalling.

(*Lord Sainsbury of Turville*) I would personally like to pay all of these people more, but the question is what are the priorities and what is the scale of the money that you can put into this? I think on this particular problem, which was by far the worst part of it by quite a long way, we have made a start in trying to correct this.

Chairman: I will allow two more comments on this topic.

Mrs Curtis-Thomas: The flow that you refer to of good students going into research is going to be something that we will see diminished in a very short period of time. As was quite rightly observed, e-science has opened the world of all our universities to all their counterparts over the world. Having travelled extensively I know that other countries covet the quality of graduates that we have and are actively seeking to enlist those as researchers into their own universities. If you want to do research and you want to go into good facilities and you want to work with people who are well remunerated what is the incentive for staying in the UK? You could go abroad and achieve all of your aspirations there. I have very severe concerns about this.

Dr Iddon

60. I have one question on that, and then I will move on to another topic. The way I see it is that we have an increasing number, thankfully, of students of the A-level grade opting to do chemistry A-level, but they are not following through into science, as you indicated yourself, and possibly one of the reasons is they see the PhD salary levels. It knocks-on, if I may say so, right down the chain to the people in the later years of school life. Would you agree?

(*Lord Sainsbury of Turville*) You have pointed to what is clearly the bottleneck, where the system is not working. We are actually, contrary to what people believe, getting more people. The increase in people doing science A-level is going up faster than the general increase in A-levels. Up to that level we are actually doing rather well, we are probably doing rather well against trends in other countries of people taking science subjects. Where it appears to go wrong is in terms of the next level, which is the university level. Whether that is because people make the decision that you do not get paid well, or whether it is about the degree of difficulty of university courses, or perceived difficulty, I am not certain. I think it is quite a lot to do with the fact that we educate people to get to that point, but by that time we have actually not enthused them about where the opportunities are in science. If it was simply a question of money, they would be looking further ahead to jobs in industry and elsewhere, because the salaries there are often very good indeed.

Chairman: I think we will stop there. I am sure, Lord Sainsbury, you have got the message. I think, perhaps, you did not need the message, I think you have understood already that this is a very important base for the prosperity of our nation and is a base that cannot be neglected for too long. It does need some nurturing, and you recognise that in what you have done, but the message from this Committee is thank you for what you have done, but we think you should do more in the future. Dr Iddon wants to move on to a new subject.

Dr Iddon

61. You did set up that review earlier in the year, presumably, as a result of the fuss that was caused over the Synchrotron debate. They have recently recommended that nine out of the 52 projects should be funded with £26 million of government funding. From which budget is the £26 million being derived?

(*Lord Sainsbury of Turville*) It comes out of the new spending of the Spending Review.

62. From the Science Budget?

(*Lord Sainsbury of Turville*) Yes.

63. So, it is not new money in a sense. My next question is, are any other areas of your budget likely to suffer as a result of that original funding?

(*Lord Sainsbury of Turville*) I think this is a question of what one means by "new money". It is one that causes quite a lot of confusion. I think there is only one lot of new money, which is the new money that you get from the Treasury. Obviously, it then cascades down. The Treasury makes it to the Science Budget, the Science Budget makes it to the Research Council and the Research Council makes it to individual universities, each of which makes an announcement. I would not say that those are new money. The new money is what you get from the Treasury, and this comes out of the new money that we are getting from the Treasury.

64. Are Daresbury expected to make any savings, long-term, to underwrite this new investment, which is very welcome, I may say?

(*Lord Sainsbury of Turville*) First of all, the £26 million is for the North West. Daresbury itself is a partner in about £10 million of the £26 million funding, and these are for new projects. There is no suggestion at all that there will be any saving to offset this.

65. Because it is an unusual regional allocation, as I said, very welcome, could I ask you why the funding is coming from the Science Budget and not from the DETR Regional Development Fund?

(*Lord Sainsbury of Turville*) It is very much for scientific research, and the basis of it was that in this particular case it is not a question of paying money to someone who lost in the competition, we actually are taking a facility away and we made a quite conscious decision that we wanted to put in projects to make certain that the science in that part of the country was supported. The team that made the allocation is largely a scientific team, and their judgment was all these projects are Alpha projects, which, while they would not necessarily have been funded because they would be in competition with others, were, in terms of quality of science, totally suitable for the Science Budget. It was on that basis that we made it.

66. Of course, the £50 million Regional Innovation Funds are also being provided to support clusters and incubators to the scientific benefit, I assume. Will

[**Dr Iddon** *Cont*]
the OST or the DTI have any say over the application of those 50 million funds which are being made available for the regional innovation funds?

(*Lord Sainsbury of Turville*) That money came through, in fact, with the DTI allocation money, and that is because we think that the innovation is absolutely key to regional policy in the future. They are, in fact, non-departmental public bodies of RDAs, but in allocating the money we set targets for them as part of their corporate plans, which we will be agreeing in February 2001. Obviously, that has output measures, so we will be talking with them about how that money is allocated.

67. As a North West Member of Parliament I have one arm in an arm-lock by my colleagues who are not from the North West to ask this question, and that is, will money from the Science Budget be made available for other regional development in science, and if not, why not?

(*Lord Sainsbury of Turville*) The answer is, no. We think this is a very particular and special occasion. As I said, it was a case where, for very particular reasons, a project which was located in one region, the next generation was put someone where else. We thought it appropriate in that case to make a contribution to science in that region, as long as the quality of that science was Alpha world-class research, and we have done that. I think this is a very rare situation and I would be very reluctant for the research council money to ever be in a situation where it was allocated on a regional basis, because that seems to be in conflict with our criteria of excellence in research and leads to the situation where, as we see in America, facilities are allocated on a regional basis and I think that is undesirable from a science basis. That is not the same as some cases where one is allocating money for innovation, where I think it is perfectly sensible, on occasion, to allocate that to where the need is greatest.

Dr Iddon: I think I have set East Anglia off now.

Dr Kumar

68. Lord Sainsbury, clusters were just mentioned and I know that you also chaired the cluster steering group, and during the recess you were kind enough to visit my constituency, and you are also aware that I raised the issue of the progress of the chemical cluster, which I have debated in this House often and have taken many questions. At that time you said that you had little information to pass on, but has there been any progress regarding the chemical cluster that I raised with you? Certainly, I was very disappointed that the RDA have not made sufficient progress in the North East. Are you in a position to say what is happening on the cluster front and what progress your own steering group has made regarding that?

(*Lord Sainsbury of Turville*) We have been working on an exercise mapping clusters round the country, which I think has proved extremely useful and we will publish that report fairly soon. That, of course, makes the point very strongly that in the North East one of the clusters that is very strong there is the chemical industry. What I hope it will do is make certain that RDAs, when they are looking at working with clusters, do not think entirely in terms of new clusters, but also give a lot of weight to how they can work with current clusters, which are important, and making certain that those do up-grade their facilities and do become more competitive in the knowledge and economy. I think there are huge opportunities to do that in the chemical industry, and that is one of the things that the North East, and also in the central side of the DTI, need to keep pressure on.

69. Do you realise that time is of the essence and we need to move on quite rapidly? I would urge you to push on this front quite quickly, because it needs some action and people are expecting action on that.

Mrs Curtis-Thomas

70. What criteria did the review team use for making its recommendation and were the recommendations peer-reviewed?

(*Lord Sainsbury of Turville*) This is the North West?

71. It is, yes.

(*Lord Sainsbury of Turville*) They were peer-reviewed in terms of scientific excellence. That work was done with the aid of the research councils, so there was an input from that. They also have the benefit of a study which was done by the North West RDA, which looked at the economic constancies of different projects. So it was mainly to do with the excellence of science.

72. I must presume that some of the projects that were submitted were Alpha rated, but, unfortunately, you have to slice the cake somewhere and those projects were, therefore, not supported. What recourse do those particular groups have in terms of obtaining funding for their projects and adequate feed-back of why their work was not selected?

(*Lord Sainsbury of Turville*) I do not know if Martin knows what action was taken on feeding back to them views about these matters?

(*Dr Earwicker*) I am afraid I do not know the details. The normal practice will be to feed-back.

Chairman

73. Are the details available, Dr Earwicker? If we asked you to write to us, would that be possible?

(*Dr Earwicker*) The answer is, I do not know, Mr Chairman. The normal practice would be for people to have feed-back on failed submissions.

(*Lord Sainsbury of Turville*) We can certainly give you the information and write to you on that.[1]

Chairman: We will be very grateful. Thank you.

Mrs Curtis-Thomas

74. Are you satisfied that the projects selected represent the best possible use of the national science funding?

(*Lord Sainsbury of Turville*) As I said, all the projects were ones which were judged to be high quality research projects. If they were put in competition with all the other projects, then one

[1] See page 11.

[**Mrs Curtis-Thomas** *Cont*]
cannot say that these would have come out top of the pile on a peer review system. That is a decision we took in allocating the £25 million to this particular project, but none of them are below the standard that people would have looked for in these kind of projects.

Mrs Curtis-Thomas: Thank you.

Dr Gibson

75. At the same time you did the review you set up a bio-technology, core-technology feasibility study. When is that going to report? How is it going to be paid for? It is almost certainly going to come out positive, because there are hot-shots up there who are doing good work. Why, again, was it put in that area of the country?

(*Lord Sainsbury of Turville*) It has reported and we are now looking at that report. I think you will have to wait until we have made that assessment as to whether we do fund it or not.

76. Why was it set-up in the North West at the same time as the Synchrotron argument was won?

(*Lord Sainsbury of Turville*) The North West is, in this area of bio-technology, extremely strong. There was this project going on and as part of our proposals, and to some extent to compensate for taking the Synchrotron out of that area, we said we would fund this particular feasibility study.

77. And the cost will come from the Science Budget?

(*Lord Sainsbury of Turville*) We have to take a decision as to whether we do fund it, and then, if we do, where we get the funding from.

78. The feasibility study, I mean.

(*Lord Sainsbury of Turville*) The feasibility study is funded, but that is not a large sum of money.

Dr Jones

79. Before I turn to the North West, not even going via the West Midlands, can I spend a few seconds in Whitehall? You were with us in February and we were discussing Forward Look and we had a lot of discussion about OST influence in other departments, and I noticed that Ms Durning has trans-departmental responsibility. Is that a new post? Are you having more influence now? We have seen the increases in the Science Budget, but what about the other department budgets, have they held up well?

(*Lord Sainsbury of Turville*) I will take them in order. We have had a trans-departmental position for some time, so that is not a new post. We are happy to put a lot of attention into making certain that there is co-ordination across Whitehall. We have a new ministerial Science Committee, which is operating in that field. I did do the cross-cutting review across science across government as part of the input to the spending review, but the final figures will have to wait until they have all been worked through, particularly budgets, before we know what the final outcome of that is. It is not possible to do it on the basis of a total single budget with each department which covers science. Obviously, science is spread through a number of departments.

80. Can I just spend a little time on the North West science and Daresbury development? What do you expect that group to deliver, and how is it interacting with the other North West groups we have been discussing?

(*Lord Sainsbury of Turville*) The report which was under Dr Bruce Smith, which looked at the allocation of the £25 million, produced a report and that includes a couple of very major projects which they felt they could not fund, and that report is going as an input to the North West development group, which is looking at the broad subject of how we can maximise the input of science to the regional economy. That really is looking at it on a wider basis than the first group was doing, which was simply saying: "Given that we have £25 million which we will allocate, how do we best allocate it?"

81. They influence the science group's budget, but do not have any specific application of their own?

(*Lord Sainsbury of Turville*) The North West does the development of the group. It is the North West Science and Development Group. They are looking at a wider question and they do not have a sum of money allocated to them.

82. What do you expect them to deliver?

(*Lord Sainsbury of Turville*) I would hope they can fulfil the terms of reference, which is to look at what could be done to make the Science Base in the North West, which is pretty strong, even more effective, in terms of wealth creation and jobs in the North West. One of the benefits of that group is that it is already bringing together the different players, which are the university, Daresbury itself, the Regional Development Agency and other bodies in the North West, to look at how innovation in that region can be strengthened. Also, of course, the whole world of the National Health Service, which is very important. I hope they will come forward with some ideas as well as projects which said that these can help strengthen the innovation in that region.

83. In what way do they differ from the RDA? The work you have described sounds like the RDA.

(*Lord Sainsbury of Turville*) Overall, that is the role of the RDA, but this will strengthen it in terms of the use of the Science Base to achieve competitiveness within that region.

Dr Iddon

84. In March it was announced via a DTI press notice that Daresbury would continue for two years beyond the new Synchrotron near Oxford coming into operation. What then? Has any consideration been given to the future of the Daresbury laboratory, which has international prestige, beyond the year 2007?

(*Lord Sainsbury of Turville*) I think the way we are approaching this is on a CCLRC basis. We did a review of CCLRC to look at the precise role that we see that performing as a research council, or body which relates to a research council, in the future. We have done the first part of that job and we are doing the second part now. Out of that, as I have said, we will produce a plan for what we think are the kind of facilities that CCLRC should be providing for the Science Base in this country, going forward into the

[Dr Iddon *Cont*]
future. It is within that context that we need to look at what the things are that Daresbury can do within that plan, and do to the best advantage of the country.

Chairman

85. Thank you very much. We have now come to the end of our session. It has been wide ranging, but it has also been in depth in places. We would like to thank Dr Earwicker and Ms Durning for coming along and supporting the Minister, but in particular we would like to thank you, Lord Sainsbury, once again, for being with us. I am sure I speak for the whole Committee when I say you have a very good grasp of a difficult brief. We appreciate that and we are grateful that you hold the portfolio you do, and we are also delighted that you are prepared to spend time with us. We are all on the same side, even if we occasionally kick the ball in different directions. We try to help each other and you certainly help us and we are very grateful for that. Thank you very much indeed.

(*Lord Sainsbury of Turville*) I have taken away at least one very clear message.

Chairman: Thank you very much.

Letter to the Clerk of the Committee from Dr Martin Earwicker, Head of Science and Engineering Base, Office of Science and Technology

At the hearing of the 25 October, the Chairman asked (Q73) if I could let the Committee know whether the failed applicants to the Bruce Smith North West Science Review received any feedback. I understand that the Review Team decided not to give any feedback.

For normal grant applications to the research councils, applicants get feedback by seeing the referees' comments and are able to respond and answer any queries the referees may have. They do not, however, get information about why they were not successful. Sometimes, they may get comments from the panel meeting prepared by the Assistant Programme Manager. These comments would be specific ie, asking that the bid be refocused and resubmitted.

I hope this answers your question.

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