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SCIENCE AND TECHNOLOGY
COMMITTEE

THE ROLE OF THE DIRECTOR-GENERAL
OF THE RESEARCH COUNCILS

MINUTES OF EVIDENCE

Wednesday 24 January 1996

Professor Sir John Cadogan, Director-General of the Research Councils

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THE HISTORY OF THE
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AND THE HISTORY OF THE
ROYAL SOCIETY OF MEDICINE

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MINUTES OF EVIDENCE

TAKEN BEFORE THE SCIENCE AND TECHNOLOGY COMMITTEE

WEDNESDAY 24 JANUARY 1996

Members present:

Sir Giles Shaw, in the Chair

Mr Spencer Batiste
Dr Jeremy Bray
Mrs Anne Campbell
Dr Lynne Jones

Sir Trevor Skeet
Mr Patrick Thompson
Dr Alan W Williams

Examination of Witnesses

SIR JOHN CADOGAN, Director-General of the Research Councils, DR KEITH ROOT, Director, Finance and Central Policy Issues and MR ADRIAN CARTER, Director, Research Councils, examined.

Chairman

1. Sir John, you know the Committee, although Mr Patrick Thompson is relatively new to this Committee. You and your colleagues, whom you will no doubt shortly introduce, are most welcome. May I just say this is the first time I think we have had a chance of an exchange of views with you since you have been, as it were, fully experienced in the post. I think we initially met in very early days. The Committee therefore, although it is conducting as you know a particular inquiry into PPARC, felt it would be right to use this opportunity to discuss general aspects of your work as well as the precise aspects of what we would like to ask about the issues of PPARC itself. Might I open the batting with a general question to you, which would be just how you would describe your powers succinctly and how you believe you should be able to use them?

(*Sir John Cadogan*) First, thank you for inviting us along. I have always found the views of this Committee really most helpful. I should introduce my colleagues; Adrian Carter on my left, who is the Director, Research Councils, reporting to me and he is one of the UK delegates at CERN, so I thought it would be useful for him to be here today because of the PPARC connotation. On my right is Dr Keith Root, who is Director of Finance and Central Policy Issues, so these are my colleagues.

2. Thank you.

(*Sir John Cadogan*) I think it might be a good idea if I did perhaps outline my job and then you could explore particular aspects of it. Very briefly, you will know of course that I am directly responsible to the Cabinet Minister for Science, Engineering and Technology and I am directly responsible for advising him on a large number of things. In particular the strengths and weakness of the science and engineering base across the piste, whether it is funded by the Research Councils or not, strategic directions that the science and engineering base should take in the light of the White Paper and other considerations. I particularly have to advise him on the cash needed to sustain and develop the science

and engineering base in order to meet Government objectives. I have to say: "Well, you really need this much money". Then, of course, I have to support him in getting that money and that is an important part of the job. Then I am responsible, too, for advising him on how that money, when we get it, should be allocated between the now seven Research Councils—there were six when I first started the job—the Royal Society and the Royal Academy of Engineering. I am responsible for looking at the staffing, organisation, efficiency of the Research Councils, better ways of cross-Council working; these are specifically referred to in the White Paper. I am responsible for advising him on the boundaries between the Research Councils and charged to keep them constantly under review. I have to ensure that the Research Councils operate in accord with their mission. I have to approve their strategic business and corporate plans. I am also the UK representative on the Joint Research Centre in Europe at large. Most of the Joint Research Centre consists of some 2,500 research staff who operate mainly in what I would call Continental Europe rather than Island Europe. That has been an important part of the job because we spend a very large amount of money there in these research centres. I am digressing a little; Madame Cresson is now the new Commissioner and she is very anxious that the Joint Research Centre should become more output orientated and related to the real needs of the Community, and in that respect we wholeheartedly support her. I am also responsible for setting the objectives of the Chief Executives with each Chairman of the Councils and measuring their performance. This is a very important lever for getting strategic ideas across. I have lots of other tasks; international subscriptions, which we are talking about, setting up a CCLRC, careers concordat, MRES, budget reviews, student needs, dual support, *etcetera*. So that is what I have to do.

3. We clearly recognise from that wide range of activities and powers that you are a very busy man. Now can we just ask you what the priority is in what you do?

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AND MR ADRIAN CARTER

[Continued

[Chairman Cont]

(*Sir John Cadogan*) The most important thing is to make an excellent case for continued support of the science base. That is the most important thing. I regard that as paramount and in order to do that, of course, one has to have very good arguments.

4. You would regard yourself as being the generator of the pressure to optimise the expenditure on the Nation's science base?

(*Sir John Cadogan*) On the science base.

5. Both public and private?

(*Sir John Cadogan*) No, sir, when I say the science base I mean by definition that part of science base which comes within the science budget, which is £1.3 plus billion.

Sir Trevor Skeet

6. I just want to ask you one or two questions, Sir John? How do your powers compare with the old ABRC, which allocated the science budget?

(*Sir John Cadogan*) Well, the old ABRC did not allocate the science budget. The ABRC was responsible for giving advice. They were purely advisory whereas I do have a certain amount of executive authority.

7. So your powers are more extensive?

(*Sir John Cadogan*) My powers are more extensive.

8. Right. The other question I want to ask you is this. I have had a look at a document, PPD28, by Sir David Cooksey and he says this: "The Council of PPARC has been pre-empted by the DGRC in negotiations with ESA and CERN and by the ordering of prior options by his Department on the grounds based on astronomy operations and he appears to take key decisions independently of PPARC so that the PPARC Council is an entity operating only at the periphery of the science budget for which it is supposed to be responsible and accountable." What are your views there, Sir John?

(*Sir John Cadogan*) Well, my first view is that I have not had the advantage of seeing this so I will try and remember what you said. First of all, the pre-emption of PPARC's inverted commas "powers" with regard to ESA and CERN, PPARC has no role in that. The decision to be in ESA and to be in CERN reflects Government policy; there are treaty issues, particularly in CERN. Where PPARC comes in is that it has to advise Ministers whether in fact they believe that it is at the top of their scientific priority to be in the CERN experiments or in the ESA experiments and having made that case, if Government puts money into it, then PPARC decides how to spend the money. The particular issue I think—and I am guessing here because I have not had the advantage of seeing the paper—came really over quite extended and sometimes difficult negotiations which took place a year ago over the entry or non-entry into the programme for the LHC, the Large Hadron Collider, and there the policy decision to be in was PPARC's only in the sense that they said it was the highest scientific priority. But when it came to negotiating inside CERN what the deal should be, that was not a PPARC issue, that was a Government issue; it is Government money after all. It is the science base money. At the end of the day there was a certain amount of disagreement, I think,

between individuals in PPARC and it may have been that Sir David Cooksey was one, I do not know. I did not have the advantage of hearing from him on that. However the main issue was that we had to negotiate some very tough things at an intergovernmental level.

9. You would be in a position therefore, Sir John, would you not, to decide whether we should go ahead with our very substantial subscription in CERN and LHC?

(*Sir John Cadogan*) No, sir. All I can do is take Ministers' instructions in, if you like, the tactics as well as the strategy of getting a better deal in CERN so that the benefits could revert to PPARC for them to spend the money as they saw fit.

Chairman

10. The point being that it is a treaty obligation that is already committed?

(*Sir John Cadogan*) That is right. I spent a lot of personal time with the Germans and French trying to get this deal. Now I should say that members of the particle physics community were very nervous. They wanted us to settle. They all said: "Settle, pay" and we said: "No, we cannot afford it" and we kept on and kept on. A lot of lobbying went on and we ignored it and at the end of the day we got a terrific deal. We got a billion Swiss francs off the price of that project and a large number of the particle physics community did have the grace to write to me afterwards and say: "Well we were wrong". David Cooksey did not.

11. Right. Okay?

(*Sir John Cadogan*) I think that covers that one, there were three points. The same applied to ESA where a lot of work went on at official level with the Germans and the French to try and get the terrific deal we got in Toulouse, so that PPARC is the beneficiary. Instead of costs going up by 15 percent there will be level funding and that is a Government decision. PPARC gets money.

12. Very good?

(*Sir John Cadogan*) The third one, please if I may, because it is quite important, was I think the prior options on the observatories. Well that is Government policy to take a prior option study on all research establishments.

13. And that you would be doing throughout the—

(*Sir John Cadogan*) Everything. So I reject it.¹

Chairman: That, I think, is relatively clear. Mrs Campbell?

Mrs Campbell

14. Sir John, you mentioned just now that when we had the Advisory Board for Research Councils they were obviously giving advice and you have some executive authority to decide on the allocation of the science budget?

(*Sir John Cadogan*) No. All I do is give advice. The question was how did compare with ABRC? I do have more executive authority than the ABRC

¹Footnote by witness: ie Sir David Cooksey's comments.

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[Continued

[Mrs Campbell Cont]

because at the end of the day I am partially responsible, with the Chairmen, for recommending, frankly, salaries for chief executives, which ABRC did not have. No, all I can do is give advice.

15. I have two questions then to follow that up. Can you tell me what advice you seek before you give your advice to Ministers, where that advice comes from and whether or not it is publicly available?

(*Sir John Cadogan*) Please do not let me forget the last bit of your question.

16. I will not.

(*Sir John Cadogan*) First of all we have to secure the science budget and I will just quickly take you through what happens. We are not handed an arbitrary sum of money. We have to account for every pound, so therefore we have to build up a case. Now the building up the case involves discussions with a very large number of people. It is only recently that we did the review of the science budget portfolio. There were hundreds of people involved and it was published in May, so I have been relying heavily on that. We have had a very wide group of people who have said this should be done, this should not be done and so on, but the Research Council chief executives, the Royal Society, the Foresight Challenge Group, all these are also sources of information for me. We have an iterative process where I work out what the priorities ought to be in the light of the people who are involved and the Councils as well, and then come up with a sum of money, and that is the sum of money we put forward. So a great deal of the advice taking is done before the allocation, if you see what I mean. We take advice in order to put the case together.

Chairman

17. Foresight is actually one of the sources you take into account?

(*Sir John Cadogan*) Yes, one of the many sources. Then we come out with a series of priorities and you will recall that the main priorities, which are agreed with all of these people, are that we should improve interactions with industry and commerce, without the science base being servants, without it being the problem solver for industry, that we should enhance basic and strategic science, with particular reference to maintaining studentships—that is the training—and maintaining responsive mode grants. We have actually underlined it this year in the allocations. The other is the enhancement to people related programmes, because without good people we are finished. So those are the main priorities. When we get the money we have the job of trying to match the money we have got with what we wish to do and then there is another iteration. To give you an example, I think the key players in this are the Research Councils themselves. Since October, which is the start of the real intensive PES round, I have had 38 separate meetings with Chief Executives, either singly or as a group, Royal Society, Chairmen of the Research Councils, Royal Academy of Engineering. So that is the sort of process we go into; countless facts and discussions.

Mrs Campbell

18. Can you tell me how much of that is published, open material and also whether your advice to Ministers is published and whether you intend to publish it?

(*Sir John Cadogan*) What has been published? We published in May a full analysis of the strengths and weaknesses of the science base and deposited in the House library a very thick document on exactly who was consulted, what they said and so forth. That is a great deal of literature which was published in the half year. That is available. I would be very glad to send you more copies if you want them. As to whether the ultimate advice is published, well, as you know, it is not customary for officials to make public their advice to Ministers, but within that restriction we do, of course, give a great deal of information in the allocations document, which I hope you have seen, where we give a full analysis of the background to the allocations, but it is not open to me to say whether anything is rejected.

Dr Bray

19. There is a clear precedent which ran over a period of years, set up at the specific request of Sir Keith Joseph on the publication of the ABRC advice and it was both deliberately introduced as publication of advice to Ministers and deliberately suspended. Why should it not be reintroduced?

(*Sir John Cadogan*) That, I am afraid, is a policy matter and is not for me, but I should remind you that the ABRC was, in fact, not an official body. It was an advisory body—it was a quango—and indeed they were not civil servants.²

Dr Jones

20. Do you have any objection to your advice being published?

(*Sir John Cadogan*) Well, again, that is a policy matter. This is a big issue, is it not? After all, I am just one very senior civil servant.

21. You may not be allowed, but would you want to?

(*Sir John Cadogan*) I do not think it matters what I want.

Chairman

22. Right. I understand. Sir John cannot answer that?

(*Sir John Cadogan*) It is for you to say whether you want it or not.

23. May I just be clear on the way in which you described it? The allocation of money to the Research Council is preceded by discussions with those individual Councils—

(*Sir John Cadogan*) And others.

24.—before the budgetary total is established?

(*Sir John Cadogan*) Yes.

²Footnote by witness: Sir David Phillips, the Chairman, was a civil servant, but the members were not.

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[Continued

[Chairman Cont]

25. Right. So they are consulted in advance?

(Sir John Cadogan) That is right.**Mr Thompson**

26. Sir John, as a new Member I am on a very steep learning curve in all of this, but I was under the impression—and your answers have already partly addressed this matter—that there was some sort of advisory council which you used, but I now gather from the briefing I have had in the last 24, 48 hours that the expert advisory group which is proposed in the White Paper does not, or has not yet been established. Now this has made me even more confused, particularly in the light of the answers that we have just had, so could you add to what you said a moment ago and say exactly where you get your advice from, whether there is in existence or likely to be in existence any form of advisory body—because you cannot do it all on your own—

(Sir John Cadogan) No, of course not.

Mr Thompson: So where are you getting the advice from?

Chairman

27. Could I just refer you to the evidence you gave to us back in 1993, when the Director General said: "If we decide to have a panel of experts it will probably turn out to be a panel we can call in at intervals to sort particular problems and give particular advice"?

(Sir John Cadogan) Yes, that you will recall was within four days, I think, of me taking up the post. If you wanted me to, what I could do is identify a core panel of experts whom I use regularly and those are the seven distinguished scientists who are the Chief Executives of the Research Councils, if you wanted to identify a core. But we do not want to restrict it to an inner circle. I would remind you of the situation. The White Paper came out and said the Director General would be assisted by an expert group who shall be an informal expert group with no executive authority. Then Mr Waldegrave, when he was Chancellor of the Duchy, gave evidence to the House of Lords Select Committee on 13 July 1993—which, I should tell you was before any DGRC had ever appeared, before he was identified—and since this is such an important issue, may I read the paragraph, because it is quite important?

Chairman: All right.

Mr Thompson

28. Before you do—

(Sir John Cadogan) This answers your question, sir.

29. I just want to re-state it because it is very important because we have had a little bit of a diversion on this subject. The expert group which was promised in the White Paper, which is the point of my question, I think I am right in saying from what I have heard a moment that this has not actually been established and is not likely to be established?

(Sir John Cadogan) Yes, I will get to that. The history is that before we even got to the question of whether there was going to be a DGRC, no matter who it was, it was clear that Mr Waldegrave had had second thoughts. He said: "I have slightly backed off in the last few weeks, on further thought, laying down in detail how the DG should handle himself. If he is as big a man or woman as I want to get in this job, he will tell me how he wants to do this job. He or she will want to consult and set up networks, whether this is a formal thing or not. I would rather hope it is not too formal, so that we begin to get into yet more cross-memberships and ex-officio applications for membership and God knows what. If he or she does the job properly they will have to carry the weight not in just the science and engineering base, but also industry because this person has to make the reality of the closer connection between research councils and the user communities and check that the research councils are not just paying lip service to the new mission statements." Indeed, within weeks of me being appointed DGRC we were getting formal representations from Research Councils saying: "We must have our man on it and on this section we must have an astronomer, we must have a geographer" and so forth, and everyone got very nervous about it. I discovered that it was very important for me coming into a new job—I had a big learning curve, too—to be able to consult a very large number of people. Government decided, and announced it on 2 February, 1995: "The White Paper anticipated that the Director General would be aided by a small advisory group, a sort of inner circle. I believe that my predecessor, now the Minister of Agriculture, Fisheries and Food, shared the view that perhaps this was not the best way forward. Sir John has demonstrated that we can improve on my Right Honourable friend's prediction. He has created not an inner circle, but an open circle into which people from right across industry and science have been able to feed their views". So that is the policy position.

Chairman: So the policy has changed and for the reasons you have given. That is fully understood. Mr Batiste?

Mr Batiste

30. In your review of the Research Councils you appeared to be quite critical of the ratio of Headquarters' staff to the budgets that they spent?

(Sir John Cadogan) Yes, I was.

31. I would like to ask you a couple of questions about that, if I may? You said that they were in fact allocating less than £1 million per Headquarters' person. Does that mean that you have in your mind a yardstick as to what sort of figure each Headquarters' staff should be responsible for?

(Sir John Cadogan) No, sir, I do not have a yardstick. Each Council is so very different.

32. So what did that expression mean then? What were the Research Councils meant to understand by that?

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[Continued

[Mr Batiste Cont]

(*Sir John Cadogan*) Well what they were meant to understand by that is that 1500 people was rather a lot of people to deal with a budget of £1.2 billion, and indeed the Research Councils have responded magnificently to that.

33. How closely are you involved in that process with individual Research Councils?

(*Sir John Cadogan*) Only in the sense that in our regular meetings there was a lot of constructive exhortation that they should do the best they could.

34. In some detail?

(*Sir John Cadogan*) Yes, in certain detail and Keith Root and his colleagues were involved, but it was truly constructive because the point is that we were saying: "If you do this, there will be more money available and you will have more money for spending. Would you rather have 1500 people in Head Office or 1500 post docs, or maybe 2000 post docs out there?" That is the extreme case.

35. That is a pretty big stick to be wielding?

(*Sir John Cadogan*) Some of the Chief Executives' objectives did have—well all of the Chief Executives had an objective which was to look at improving things and they have done it magnificently. They have not needed pushing. Indeed in the almost two years to the day, sir, since I came into this job, we have seen that number of 1500 drop down to somewhere around—we are down from 1450 to 1240 today. That has been done without any compulsory redundancies at all; it has been done smoothly as well, so they deserve a pat on the back.

Chairman: I am sure they would like to have one.

Mr Batiste

36. Within that reduction do you feel there is any evidence to suggest that some of the administrative burden of the Research Council's work has been passed down the line to the researchers who they are funding?

(*Sir John Cadogan*) No, I have no evidence for that whatsoever. Quite the contrary.

37. What proportion of the Headquarters' staff now are primarily concerned in supplying you with the evidence you need as part of your activities, as opposed to looking downwards and distributing the money?

(*Sir John Cadogan*) There is no significant difference in the proportion of people providing information from the Research Councils now as under the old regime, except there are less of them.

Dr Jones

38. Can you tell us how many staff you have in your own organisation?

(*Sir John Cadogan*) I have 37 people and we operate £1.3 billion.

Dr Williams

39. In the allocation of resources there are some areas that cross the Research Council boundaries. Take mathematics in particular; how do you deal with allocations for mathematics?

(*Sir John Cadogan*) Although it is an all pervading science—I call it a science, mathematicians like it to be called mathematics—the responsibility for the funding of mathematics, the protection of the cutting edge in pure and applied mathematics actually resides in one Council and that is EPSRC. In fact, in my very first suggested allocation to the Chancellor, I did express concern that I thought that mathematics was in danger of sort of slipping away. You know, it does not hit the big high spots and you will perhaps recall that we recommended to that particular Council that, as a priority, they should put more money into mathematics which was extended last year and has been continued this year. So that deals with that one, but there are other areas which cross Councils; chemistry is one. Part of the chemistry funding responsibility at the White Paper stage was actually transferred from EPSRC to BBSRC. So there was a concern that this was properly done so there is a cross-Council operation, the BBSRC/EPSC Biomolecular Sciences Committee, which is chaired by Professor Ley, FRS, from Cambridge, a very distinguished person. For financial convenience, BBSRC handles all the money, but there are representatives from both Councils on that Group and it works extremely well. There is also a joint Interdisciplinary Research Centre in molecular studies in Oxford which is funded jointly and also involves the MRC, so it works very well.

40. May I ask about the Technology Foresight exercise? You said that that was one of the factors in a lot of advice that you had during the course of the year and when we look at the allocations this year, compared to last year, and in what is a rather meagre size allocation, just up about 1.3 percent in cash terms, the growth there is different from other Research Councils and I notice that for PPARC and the NERC the growth is quite low, but it is a larger growth than both for the BBSRC and the EPSRC? Does that reflect the influence of Foresight away from particle physics and into perhaps more useful areas of science?

(*Sir John Cadogan*) Well, particle physics has gone up. You will remember particle physics has this awful burden of the international subscriptions, but particle physics funding has gone up every year since I have been involved and indeed with the savings we have been able to affect in ESA and on LHC, despite the worry of some Council Members that we should not have done it, this money does come back to PPARC. Generally—I am not quite sure of the drift of your question—all Research Councils have had a little bit more money and it does vary somewhat from one to another.

Chairman

41. Dr Williams' point was the scale and the percentage. 7.6 percent went to EPSRC. Now that is quite a substantial increase in cash terms. Was there a reason for that perhaps?

(*Sir John Cadogan*) One of the reasons was that part of the things that the money went into was research studentship support, and of course they had by far the most research students. That also includes a pension component and they have more

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[Continued

[Chairman Cont]

pensioners, so there will be a variation and of course they did have a lot of expensive initiatives which started last and the year before and we were pledged to allow them to continue those initiatives. It is not Government policy to have a *pro rata* increase. Everything is looked at on its merits. Of course, if I could just say, when we allocate £1.3 billion we do not have £1.3 billion to give out, because most of it is committed on long term work so we actually have quite a small part. It is something like give or take £150 million of which £40 million, straight off the top, goes in studentships, £18 million straight off the top, which is sliced off the Councils, goes into international fluctuations, so you do not have a lot of flexibility.

42. Could I just be clear? Part of Dr Williams' question was seeking to relate increases in expenditure to Foresight priorities or new projects added to them, which gave them therefore a call for new money. Now can you demonstrate that that has happened?

(*Sir John Cadogan*) It is mainly a volume effect here. The Foresight recommendations and priorities are one of the factors, but a very important factor which is taken into account by all the Councils when they decide where their priorities should lie. Indeed a large proportion of Foresight activities actually do relate to that particular Council, but there is no direct correlation between the number of Foresight priorities and the fact that they have got £3 million or £4 million more.

43. I see.

(*Sir John Cadogan*) Dr Root, is there a hidden number in there I have missed?

(*Dr Root*) No, I do not think so. I think the important thing this year was mainly a process of consolidation of the quite large wedge of initiatives that went in last year and is largely determined by the figures that came out on the spread sheet. There were one or two new initiatives this year but nothing like as many as last year.

Dr Jones

44. Sir John, you are quoted as having said that there are a number of vital areas to wealth creation and enhanced quality of life where the United Kingdom has pinnacles of excellence, but the level of effort needs to be increased to enable the old values to be obtained. You have listed several areas—I will not read them all out, but it is a very lengthy list. To what extent has that informed your advice to Government on the level of resources needed and the way in which resources have distributed?

(*Sir John Cadogan*) It has been significant in the sense that it has coloured my advice to the Research Councils when they reorientate against their priorities and they have been taken into account, particularly by EPSRC, MRC and BBSRC. BBSRC particularly has taken account of that. So there is iteration which is reflected in what we put up to Ministers. You see, it is no good saying to Ministers we really do think we should spend X million pounds extra in this particular area if the analysis of the resource base shows that the people are not there and that is why it has to be iterative with the Councils.

This is not a blind man's bluff game where you say that is a nice number, let us put it up and the words may sound good. At the end of the day we have to make sure that we have good people and good areas and that good ideas are coming forward. Happily, in most cases, there is a matching.

45. So are you satisfied with the resource allocations?

(*Sir John Cadogan*) Oh no, we have a very long way to go. I mean, I am very worried, if I may say so, about production engineering. I am really quite worried about production engineering. I received a very strong message from a large number of people who—if we had had an Expert Group I doubt if there would have been a production engineer in it—but a large number of people out there in industry were worried—I said to them: "Well, if you were me and you could put the money in one place and one place only, where would it go?" That was the question I was putting to them and they came back to me and said: "Production engineering" and we do not have a base in the universities to deal with it.

Mr Thompson

46. I could pick up on the particular point of production engineering because I was going, in a moment, to ask something about pure and applied research and that opportunity may come; it may not. In terms of production engineering I would have thought that surely industry itself, following up from what you just said and picking it up, as they are so agitated about this should be themselves putting a lot more investment into the research into production engineering. I am not saying that the Research Councils should not, but you have just opened up a question in my mind, because I was thinking about arguing about pure *versus* applied research and suddenly you mentioned production engineering. Why is not industry doing that job itself?

(*Sir John Cadogan*) Well, I think part of the reason that industry were complaining is that they are doing it, but they are concerned that they are not getting a high enough flow of highly creative people working at the front edge and that is what the science and engineering base is about. It is not about devising a new method of producing acetic acid in Hull. It is about producing people who are front line—

47. So you are concerned about the supply of production engineers?

(*Sir John Cadogan*) The supply of well trained engineers, which is a very important part of my job—

48. Is that not a different issue?

(*Sir John Cadogan*) No, sir, with respect. It is actually crucial to my job. We are talking about the provision of the manpower, womanpower needed to do this, but also we want people to be doing more generic investigations into production engineering; networking, feedback analysis and so on.

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[Continued

Dr Jones

49. If I could just finish my question. You talked about discussions with the Research Councils and obviously you feel that they have taken on board your concerns, but if you felt that a Research Council was failing to support a subject adequately, what would you do about it?

(*Sir John Cadogan*) Again, it would be iterative. In the discussion I am relying on the Research Councils also to tell me what I should be doing, apart from me telling them. It has to be iterative, they are the experts, but if we did get such a situation—I hate hypothetical questions, but why not; this is a great place to talk about it—where genuinely it seemed to me that we were missing an opportunity and a particular Research Council was refusing so to do, then of course that could be taken into account in the allocation because we would have to agree together what the priority was and if they came up with something which was a much lower priority than something which seemed to be higher priority then I would not be recommending that that particular one would be funded.

Chairman

50. You have a financial sanction?

(*Sir John Cadogan*) Well at the end of the day I recommend to the President where the money should go, but that is a very hypothetical one and I stress it is hypothetical. I am prepared to discuss it in such hypothetical terms because I think actually it is inconceivable that we would get to such a situation. We have a very good relationship.

Dr Bray

51. Is it not likely that such a situation would not lie simply within the basic research field. You mentioned production engineering. I think most countries would feel this really did not belong in the science base at all and it raises questions about what should be done by the Department of Trade and Industry directly funded programmes or whatever?

(*Sir John Cadogan*) Well, the way the science base budget is set up is that it specifically and crucially addresses the training of people and I would not agree that training in engineering is necessarily something that is just an industrial responsibility, far from it. I used to go to Germany when I was in business for many production engineers because their training was different.

52. Yes, exactly, but it was not just by Max Planck institutes—

(*Sir John Cadogan*) No, it was in the universities.

53.—or the universities.

(*Sir John Cadogan*) It was in the universities.

54. It was by the technical high schools and industry?

(*Sir John Cadogan*) It was in the universities that we used to get them. Aachen, wonderful place.

Dr Bray: Can I invite you to look at the history of the Interdisciplinary Research Centre and Engineering Design at Glasgow where the performance was such that it had to be closed within

about two years on a peer review and it really raised very starkly the problem of what is the proper sphere of activity of research?

Chairman: Let us regard that as a prospect you might have a look at subsequently. Sir Trevor Skeet?

Sir Trevor Skeet

55. Sir John, you refer to Germany, the shortage of money for research. What evidence do you have for the increased industrial funding for this purpose? We know firms like Glaxo-Wellcome pour money into research because they can see some future advantage. You mentioned about the production engineering. Government money is not going there, you have not got it; is industry providing it?

(*Sir John Cadogan*) Industry does provide a surprising amount of money for strategic research.

56. It is increasing?

(*Sir John Cadogan*) Yes. I have not really had enough time—a good example of strategic money and I am talking now about strategic money, not doing contracts—

57. No, strategic money?

(*Sir John Cadogan*)—where industry is putting it in because they see that there is a generic underpinning of the work they do and they want somebody to do the early warning work for them. The ROPA Scheme showed that there was a very significant amount of strategic money going into universities without anybody helping. Now that is good. What we do not know is whether that is going up or whether it is going down. We do not know that yet. The ROPA will be a measure of it, because the ROPA has been running for only one year.

58. Yes, but you will be able to tell us this one. We can compare our performance if we compare it with Germany and France?

(*Sir John Cadogan*) In terms of industrial money going into it?

59. Industrial money going into these important sections. Are we spending more or less than they are?

(*Sir John Cadogan*) How much strategic money is being spent in universities is a very difficult number to get hold of. Until we did the ROPA you did not know what it was. Now I do not know what it is in Germany, but what I do know—if I can wear my previous hat—is that in my last job I was responsible for some 35 research laboratories all over the world, many of them in Continental Europe and many in the United States. We had a very good scheme of doing strategic work in the universities in my company, which I do not think was bettered by anybody, and what we did know when we went to talk to the universities in Germany, and in France, *etcetera* they were utterly amazed that we were coming wanting to do strategic work. So the evidence we got was that we were way ahead of what was happening with German industry in German universities. German industry tended to want a more directed research. That was our impression then, but I do not have any data.

Sir Trevor Skeet: Pity.

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Chairman

60. That is something that might go on in the future. Before we proceed, we are I think going to find a little push on time if we are not very careful. Your delightful answers we would like have; we will try to make the questions short and then perhaps the answers will follow?

(*Sir John Cadogan*) We will do a deal!

Mrs Campbell

61. Sir John, I am concerned about the way that the DTI has run down its industrial research programmes. It is done on the grounds that there are more useful ways to support industry, which may well be the case. I wonder if there is a danger that programmes like the IMI, the Innovative Management Initiative, mean that Research Councils are perhaps being diverted from their proper role into filling that gap that has been created by the withdrawal of DTI money?

(*Sir John Cadogan*) Well, you will have to talk to my colleagues in what I might call ODTI—the other side of DTI—about that, but the actual money that DTI spends on what we might call science related operations in fact dropped largely because they pulled out of the fast breeder reactors—and because the nationalised industries went away—but there was a Government decision taken some time ago that DTI's job really was not to do research, but to actually make sure that the products of research and technology were very well transferred into industry. Their job was to help industry do what industry should do. That was the policy; that is a defensible policy. So, indeed, if you are concerned about that, there is a Select Committee which looks particularly at DTI. Now coming back to the question of IMI, the Innovative Manufacturing Initiative. That of course is a co-ordinated initiative. It is evident that really new ways of manufacturing are crucially needed and these are research led effects. I certainly saw it in my last post. It is no good producing an advanced material if you cannot process it in an innovative way. The lithium aluminium alloy, with the silicon carbon implants and so forth; it is fantastic stuff, but if it breaks—

62. I am not questioning the value of that type of research?

(*Sir John Cadogan*) Well that is what IMI is supposed to be doing.

63. What I am questioning, I think, is whether that is properly done within the OST budget or whether it should be done within the DTI budget?

(*Sir John Cadogan*) I would certainly not be recommending to Ministers that the science budget should be used to do technology development and the IMI programme specifically excludes technology developments. Everything that goes into IMI is at the frontier. It has to be down at the discovery end rather than the development end. So I would be worried too, but I am not.

Dr Jones

64. It is not a specific cut-off. It is a continuum? (*Sir John Cadogan*) It is a continuum and you have to use a judgment, but I am watching it like a hawk.

Mrs Campbell

65. What seems to have happened within the DTI is that as its domestic R&D budget has declined from around £600 million to around £200 million from memory, the spending on the European Framework Programme has increased and we are getting a situation now where the DTI is spending a lot more money through Europe on R&D than it is on its domestic R&D budget, or will be. Is that correct?

(*Sir John Cadogan*) I honestly do not know the answer to that but I can try and find out, but of course the European money is Framework money; it is not DTI's money.

66. But the attribution to the DTI is growing?

(*Sir John Cadogan*) Well, the attribution to the DTI may be growing but at the end of the day it is not DTI money. We do very well in Europe. We get about 18 percent back for 14 percent in.

67. But we do have far less control of it when it is channelled through Europe than we would if it was spent directly by the DTI?

(*Sir John Cadogan*) That may well be so. You are taking me out of my field of knowledge here.

Mr Batiste

68. Are you satisfied from your viewpoint that the ring fencing of the science budget in the Office of Science and Technology is adequately protected within the framework of DTI? Do you see evidence at present of any erosion?

(*Sir John Cadogan*) I am perfectly satisfied. I have seen no evidence whatsoever. I see nothing but benefit from being involved in that operation and look at the facts. Look at what we did with the science allocation; we did extraordinarily well. Admittedly, I took a bit of a friendly caning here and there from the rest of DTI afterwards. No, I am very happy about it. I mean that.

Dr Williams

69. What responsibility do you have for the health of scientific research in the universities?

(*Sir John Cadogan*) Very significant, because a large part of the Research Council money ends up in universities. 78 percent of the money going into Physics Departments, apart from the Funding Council money, comes from Research Councils, for example.

70. Are you concerned about the problems in HEFC? That is, if you look at the grant over a 10 or 15 year period, things improved in the late 1980s, but in real terms the amount of money from the Higher Education Funding Council is no higher really than it was in the early 1980s?

(*Sir John Cadogan*) I am constantly concerned that we get the best value for the money that is available and the recent collaborative exercise we made with

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[Dr Williams Cont]

the English Funding Council and the Welsh and the Scottish on equipment we regard as a very big step forward. We will get a lot of synergy; get better bang for our pound.

Mr Thompson

71. Sir John, I am a bit worried about committees. We have been talking about advice and now I have been reading about the Science and Engineering Base Co-ordinating Committee and looking at the names of the very busy who are on it, including yourself. Can you say just a tiny bit more about the work of that Committee? Does it have a strategy? What has it discussed recently? Is it a bit more than just a talking shop? Does it have a real use?

(*Sir John Cadogan*) It does not meet very often. It does have people who carry punch. It consists of the Chief Executives of the Research Councils, the Chief Executives of the Funding Councils, members from the Department, I am a member and it is chaired by the Chief Scientific Adviser who has transdepartmental duties. We are certainly very concerned that we make this thing work, but of course it is not an executive meeting but quite properly, I think, the White Paper said that you have to make sure all these people are talking. Now in fact a lot of bilaterals and trilaterals go on. The funding initiative between the Funding Councils and us did not come through SEBCC; it came through direct discussion. I thought you might ask this question and what has come up very recently is the very vexed issue of making sure that we have a decent career structure for contract research workers and that is where it was thrashed out.

72. Research workers within the universities?

(*Sir John Cadogan*) Yes. Research Councils fund research workers within the universities or wherever and a lot of them felt that they did not have a career, they had no maternity leave some of them, sick leave - it was all higgeldy piggeldy. We said: "Well, we have to put this right" and we did it in the SEBCC, because remember the universities are the employers and the Research Councils are the providers of the money, so that is a good example.

73. This has sparked something off. So you agree that there is a lot of concern in the universities and elsewhere about the career structure and prospects for our young, brilliant researchers or whatever? So this is something that this Committee is looking at?

(*Sir John Cadogan*) It has looked at it and we have just produced a report which is out for consultation right now. There are lots of others, too. I have a long list here. I was ready for this. I can send it to you, if you want!

Chairman: I think that will be all right for the moment! Dr Jones?

Dr Jones

74. I was very interested in what you were saying about contract workers. You feel that the report will crack the problem, do you, if it is implemented and you are satisfied there will be the resources to implement it?

(*Sir John Cadogan*) It is a so-called Concordat and the Concordat has been accepted by—and believe me, getting acceptance from umpteen chartered bodies is something - all Research Councils, by the Funding Councils and it was accepted in principle by the Committee of Vice-Chancellors and Principals who of course are the people who have to do it, but they have now called a halt to look at it again, much to our disappointment. They have called a halt because they are still negotiating with the charities who also fund people, and the CVCP are trying to persuade the charities to buy in to what we think are pretty basic conditions for looking after young people. I say no more than that, but I am confident that it is going to work out.

75. You referred to the other deal with the Funding Councils in relation to equipment and you yourself said that there is a need for more equipment, but the competitions that have been set up and the money that has been allocated, do they not depend upon some industrial support? Is there therefore not a danger that the commitment in the White Paper to basic research is really a commitment to basic research that does not need expensive equipment?

(*Sir John Cadogan*) That is a fair question. The total sum of money is something like £18 million from the Research Councils and from the Funding Councils and in order to lever up more we are saying you can go and get partnership money from users—it can be industry, it can be charities, it can be other Government departments—and there is plenty of evidence that there is money around. Whether there is another £18 million there I do not know, we will see, but the idea is that we can get leverage. Now you may say: "Does this mean that we are going to go short term"? No, not at all. If you buy a big instrument and half the price is paid by industry, you have an instrument which will run 24 hours a day doing super stuff, and there will be time on it for industry to do their particular problems. There is no suggestion that because industry puts in 50 percent that they will control what the university does. It may be that they will choose to do a collaborative series of programmes; well, that is great, as long as it is strategic. I do not believe there is any problem over that. It is something that has been going on for many years. We are just trying to encourage it and by getting the Research Councils and the Funding Councils working together we are hoping to have, for the first time, a pretty good, synergistic look at where the needs are.

76. That may work in some areas, but surely there will be areas that will slip through that net?

(*Sir John Cadogan*) Well, maybe.

77. And bearing in mind that with any reduction in the universities' funding, is there not a danger here that their role in providing for basic research, which will later provide the capabilities for applying for grants from the Research Councils or industry and so on, is going to be undermined?

(*Sir John Cadogan*) That danger may exist, but it is the Research Councils' duty to avoid it because, after all, they have to assess the quality of the work and the programme before they award the money.

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Chairman

78. Will they take this point into account though?

(*Sir John Cadogan*) Of course they would. Sure, they would certainly not be seeing this as some way of going short term—the last thing they would want is to see the science base destroyed, so they would be watching that all the time.

79. Very good.

(*Sir John Cadogan*) Remember 80/20 is a good solution. You see, nobody ever gets anything 100 percent right.

80. That is an admirable thought to stop on! I am glad to have that on the record! May we now turn to European research projects? Now we heard a lot about the 4th Framework and it was good news and we were high users of it. Now tell me about Framework 5; are you involved in the negotiations with that?

(*Sir John Cadogan*) Yes, in several ways.

81. Tell us what your role is?

(*Sir John Cadogan*) I am part, of course, of the strategic team in the Office of Science and Technology, headed by the Chief Scientific Adviser, and we work very closely together. Indeed it is only in the last few days we have set up preliminary meetings to have a look at the funding. There are some very interesting numbers in the 4th Framework, if you remember. 5.2 billion ECUs in IT and related things, 1 billion ECUs in fusion and so on and so forth. So there are some very interesting numbers, so we look at that. I am also involved in my job in Brussels and elsewhere in the Joint Research Centre, which of course are main beneficiaries of the Framework programme.

82. You are giving the Committee an encouraging view of the things that are going to develop from the Framework?

(*Sir John Cadogan*) Well, I do hope—Bob May and I, maybe we are naively optimistic, but we do believe we have an opportunity to significantly influence at least the advice that goes out in the framing of the 5th Framework.

Chairman: Very good. Now we turn to CERN. Sir Trevor?

Sir Trevor Skeet

83. We have a better understanding of mass and the nature of the universe, but what is your estimation of the net gain that we secure from the membership of CERN and ESA?

(*Sir John Cadogan*) The net gain in scientific terms?

84. Well I am thinking in overall terms because you are putting a lot of money into it?

(*Sir John Cadogan*) Yes, we have 14 percent of the budget. The subscription to CERN is very large, as you know. It is about £75 million all told. More than £100 million by the time we put our people into it. It is one of the great experiments. It is a thing that can only be done internationally. A tremendous amount of very high technology comes out of it. Whether it spins enough into this country remains to be seen. A lot of it spins into Switzerland and spins into France, but you should never do a project for spin off; you should do a project for its prime purpose. When

people say to me: "There are terrific spin offs and we can spend the money", I say: "For that sort of money I expect spin off". You do not get any brownie points for spin offs; if you did not get any spin offs it would be a disgrace, but there are some spin offs and I mean that. It is of course a very seductive experiment, to try and find out about what happened in the first blink of time. We all know mass converts into energy; look at the atomic bombs and all that sort of thing, but the concept that energy converts into mass is not quite so well appreciated, but that is the principle and they are trying to develop that. It is a very seductive experiment, and it is an experiment the Government has decided to be part of, it is treaty bound, but it is not an experiment which Government feels should be carried out at any cost.

85. Can you put it in simple terms for the benefit of the public, for the public out there, not knowing that most of the things that we derive now are based in physics and also astronomy, can you tell us simply what we secure?

(*Sir John Cadogan*) As a nation we secure a small number of very highly trained people, but we also secure the satisfaction of being part of a major Pan-European experiment. However, if you are saying: "Can you point to this curing cancer, or can you point to it creating 10,000 jobs?", the answer is: "No, you cannot". It is our contribution to truly basic research. Almost everything else we do is strategic and it is Government policy to be in, but not at any cost.

86. Since we have such a large influence there, why is our contribution very much less than Germany and France?

(*Sir John Cadogan*) Financial contributions?

87. Yes?

(*Sir John Cadogan*) Financial contributions are based on net national income and it is quite a complex formula, which I hope you will not ask me to explain now, but Mr Carter can if you want him to. The four big spenders are Germany, France, Italy and the United Kingdom and we have 14 percent of the cash and we have a very significant scientific input. It is true to say that if it was not for the British scientists, I believe CERN would collapse.

Sir Trevor Skeet: Exactly.

Dr Bray

88. CERN does pose particular problems in funding. First of all it is dealing with an area of science which, frankly, the public really just does not have the faintest idea of what it is about. I do not think this Committee has frankly and I do not see how a particle physicist who does understand the mathematical basis of what it is about can explain it to the public. There is a huge gap in understanding there which I do not think that either the scientist or the public can bridge?

(*Sir John Cadogan*) Well I think the best people to explain it are probably not the particle physicists.

89. Well, we are ready to listen to anybody and we are—

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[Dr Bray Cont]

(*Sir John Cadogan*) Well I am prepared to give you my thinking. When I was a teacher, I always made sure that no thermodynamicist taught thermodynamics!

90. You see, in the context of that, there is the problem of how you decide what level of funding you should put into a programme where you take one decision once every 20 years?

(*Sir John Cadogan*) Well, unfortunately—

91. Sorry, could I just give, from our evidence—Professor Donnachie, who is a veteran at sitting on committees and boards and chairing committees and boards of both SERC and CERN there makes the point that it is 5 years from the initial design to concept approval, 10 years from approval to completion and 10 to 15 years for exploitation. What happened last time a major question came up was that the British Government set up the Kendrew Committee and it had a look at the field as a whole. It was at the request of the Prime Minister, with none of the members of the Committee being particle physicists at all and they said: "Yes, this is very high grade science" and on the basis of that Britain committed itself to another round of CERN funding. Now how do you see that kind of decision being taken in the future; a once in every 20 years decision?

(*Sir John Cadogan*) One can renegotiate. We did renegotiate significantly last time on the Large Hadron Collider. I hope you accept that that was an unusual negotiation and we did succeed. The amount of money is not an arbitrary sum of money. We are bound to put in 14 percent of what the particular budget is which is agreed by all the CERN Council. We have a problem in that that goes up and up and up because of the Swiss franc and all that sort of thing and indeed because the United Kingdom's GDP has actually increased relative to others. We said in the allocation or the budget that we could no longer sustain increases of this magnitude. It has gone up 15 percent per annum over the last two years and if that continued then we would be 100 percent over budget soon and we cannot afford that. We will be entering into negotiations with our partners in the coming year—a major objective which has been laid on me—to do something about this. This is not something where we sit there and willy nilly are just drawn through and just fork out the cash. We are going into serious negotiations to return us to stability for this big expense.

Sir Trevor Skeet

92. This is nothing to do with science. This is the exchange rate. Should this not be the responsibility of the Foreign Office as in Italy?

(*Sir John Cadogan*) Whether it should or should not, it is a science based problem and it is very much a problem for me because at the moment the £18 million extra we have to find this year has been top sliced off the science budget and the rest of the Councils are taking their share.

Dr Bray

93. Sir John, you still have not addressed the question that I put to you. These are just marginal adjustments year by year which are getting beyond the bounds of acceptability; fair enough. That is a short term problem and a marginal one. What I ask about is the main problem, the main decision where the majority of the science base today thinks that particle physics simply does not deserve the present level of funding and that is the consensus judgment today?

(*Sir John Cadogan*) That is correct.

94. Now are we to go for another 10 years and then have the science community bulldozed into continuing whatever the present level of funding is for particle physics for another 20 years after that? What is the machinery by which you can set up a review going beyond the scope of the Kendrew review?

(*Sir John Cadogan*) The decision to stay in or not to stay in is a Government decision, a Government policy decision to be part of this big European venture. Now that is it, and it is for Government to decide whether indeed they should come out of that, in which case they would have to negotiate a withdrawal from the system. The treaty allows withdrawal, but it is a Government decision. I have to say that everybody outside particle physics would say: "Do not be involved at all". I have to say that when I conducted my review of this for the science base survey nobody except for particle physicists spoke up for it, nobody. The industrialists just could not understand it. "It is all a waste of money"; they said that, that is true, but we are in.

Chairman

95. But even the particle physicists, if we understand from the press release about the science projects, say: "In the case of CERN and particle physics the projected subscription increase is so large as to continue to threaten the whole balance of the UK programme". Now that is very serious and cannot be ignored now, can it?

(*Sir John Cadogan*) No, and indeed if you recall, they agreed very much with the line that the Office of Science and Technology is taking and I have to say that this is a major issue this year.

Dr Bray

96. Is it not buck-passing to say that it will be a Government decision?

(*Sir John Cadogan*) I am sorry, Dr Bray, but it is a Government decision. My job is to carry out Government policy, whatever the government of the day is.

97. But your management of the thing in the intervening years is to set up a situation where Government has no alternative but to accept one decision at the end of it. If you said to the particle physicists today: "There will be no next generation big machine and it is up to you now to find ways of pursuing an experimental basis for your theoretical developments". Now if you go to Rutherford you will be shown clever laser devices on a bench top

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which do achieve high levels of energy and you will be given explanations as to why this is not really practical as an alternative to the big machines in the light of today's judgment. If you ask then how much money is going into really finding an alternative experimental basis for particle physics it is minimal?

(*Sir John Cadogan*) Indeed, because we have this big operation out there which is moving on from success to success as they see it. I am not in a position—and I would not be put in a position—where I would have to be the scientific judge. That is why we have an independent research council called Particle Physics and Astronomy. At the end of the day they have to make a judgment as to whether this is their highest priority. Up until now they have been saying: "This is the best experiment in town, we want to be in there. Everybody else wants to be in and we are leaders in it and we want to be there". They are now saying: "But wait a minute, not at any cost". So coming back to what I believe to be a criticism of what I am trying to do when you said: "Thanks to my management we are presenting the Government with no alternative", my management is to get the best value for the money we have and indeed to do everything possible within the treaty confines to make sure that the CERN operation is cut down to a reasonable size so that we can afford to be in it, because that is Government policy. Now if indeed Government said: "We are no longer going to be in", then that would make things a lot easier. It would remain to be seen whether that cash would still remain in the science budget.

Dr Jones

98. There does not seem to be though this iterative process which you were talking about earlier in relation to your own discussions when it comes to the discussions between yourself and any other organisation in relation to this issue. You just keep saying: "It is Government policy"?

(*Sir John Cadogan*) It is Government policy to be in. It is a treaty, you see. It is the largest experiment by far which is bound by treaty.

99. But they can take a decision otherwise, but they need advice, pressure from appropriate sources. You just said a few minutes ago that when you took your consultation very few people supported it, surely then you have a responsibility to feed back that and the consequences of that?

(*Sir John Cadogan*) Yes, indeed.

Chairman

100. Your advice would be sought on policy, on anything that came close to the renegotiation?

(*Sir John Cadogan*) Yes.

Sir Trevor Skeet

101. Sir John, to be positive about this, as the United States has got out of this its SSC accelerator, should we not get a larger contribution from them? They use the facilities, and also from the Japanese?

(*Sir John Cadogan*) Yes, certainly.

102. Well you are our negotiator; what are you doing on that one? How far have you got?

(*Sir John Cadogan*) I will tell you how far we got. We had a lot of arguments about paying up the cash last time without making any fuss and not making a noise and I said that if we did that we would never get the Americans and the Japanese in. The Americans and the Japanese would only come in if we had a really hard, tight operation and indeed that so proved to be the case. The Japanese are in, they are in for 5 billion yen, which I gather is £32 million.

103. But the Americans are not?

(*Sir John Cadogan*) The Americans—we want to put a lot of pressure on the Americans. They ought to come in; they are getting a free ride at the moment.

104. Yes, well having a free ride is all very well, but when do you see light at the end of the tunnel and they will be partly contributing?

(*Sir John Cadogan*) I hope to see light at the end of the tunnel by the end of this year.

Sir Trevor Skeet: Oh, good.

Mr Batiste

105. Two questions, if I may, flow from a visit I made to a physics department at a university a week or so ago. The first is they say that because of the large money that goes into the subscription in CERN, there is now insufficient money for us to exploit our membership and that, in fact, we have got ourselves into a self-defeating spiral of downward participation. We are not at the sharp edge of the work that is going on in CERN at the moment and the situation, as far as one can see, is getting worse. It was put that a not dissimilar relationship exists so far as space is concerned because we have inadequate funding for our national programmes. We therefore have two big subscriptions that we are bound to and because we cannot add to it by way of additional national funding we are not getting the benefit that our subscriptions would otherwise entitle us to. Is that right?

(*Sir John Cadogan*) I agree. That is why I am making such a fuss about the continued increase in the subscription to CERN. We are soon going to get a situation that the £110 million that we allocate to particle physics is going to be totally consumed. In three years it could be consumed by the subscriptions. There could be no money left for people to do the work; that is why it has to stop and that is why I am speaking very strongly with the Director General of CERN at the moment. ESA was looking to get that way, but as a result of the negotiations which have gone on during the year, when indeed the Minister for Science and Technology pulled it off in Toulouse, when nobody believed he could do it. We have taken a lot of pressure off now and the Particle Physics and Astronomy Chief Executive has said: "Well, this is good news. It means we may have a bit of an easement now". That again is the same issue; the subscription has gone up £2 million this year for ESA on the basis of currency fluctuations. That is a gold plated operation, of course.

106. Yes, absolutely.

(*Sir John Cadogan*) So we worked at that, too.

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[Mr Batiste Cont]

107. The other part of the question that was put to me was in relation to something you said earlier that one of your prime objectives is to get high quality people participating as part of our science base. It was put to me that as a consequence of our membership of CERN we have a number of very highly qualified, of the very highest qualification—again experienced in particle physics—but a very high proportion of them come back to the United Kingdom and do not pursue a specifically scientific career but pursue general industrial careers. Now there will be different views as to whether that is a good thing or a bad thing; I would think that is probably a good thing, but is it actually true?

(*Sir John Cadogan*) I think it is a non problem. PPARC receives 15.8 percent of the funding from the science base and produces 2 percent of the PhDs, so there are not very many of them and indeed they are very good people. I would not accept that they are any better than the very good people coming out of molecular biology or whatever and indeed if they do go generally into industry, that is absolutely terrific as far as I am concerned. I do not think it is a problem.

Mrs Campbell

108. Sir John, if you were in a position of having to review these international subscriptions, which would you cut and why?

(*Sir John Cadogan*) I would go for the CERN one first because it is so large and also I believe that we have a better opportunity to do it there. We have achieved quite a great deal in ESA. It has been a bit unsung because it is not such a big one, but remember we were going into ESA and people saying the world was going to end, the Brits were asking for 15 percent to be dropped to zero and the whole thing would fall to pieces. Miraculously it has all happened, but it is a smaller sum of money. CERN is a big number and I also believe, quite frankly, that there is more room for CERN to do something about its own operations. It is a huge operation. It has a very large budget. It takes money in in Swiss francs and pays them out, some in Swiss francs, a lot of it goes out in French francs and other European currencies and what is more it is a budget which never seems to go down, not in my limited experience. Very large sums of money go in there, they are very well paid, they pay no taxes. At the last Council meeting Mr Carter, who was part of the United Kingdom delegation, the German delegation and the Italian delegation said: "No salary increases". We paid 51 percent of the money between us and we were outvoted by—how many of them were there?

(*Mr Carter*) 16 to 3.

(*Sir John Cadogan*) 16 to 3, and CERN got its salary increase. I am saying: "No".

Chairman

109. Are there no sanctions that can be applied by the fact that you have 51 percent of the equity, as it were?

(*Sir John Cadogan*) Not there because it was not a vote on extending the budget.

110. And the British director? Is he not able to at least try and pursue these—

(*Sir John Cadogan*) Well the British director—whether he is British or not perhaps is not relevant at this stage—but the Director, I think, has the task of trying to do the best he can for (a) the budget and

(b) keep his staff going. Indeed the original salary increases proposed were much higher than what were finally approved, so it can be seen that he has done a good job there.

Mr Williams

111. In view of the exchanges in the last 20 minutes where you have been strong in your comments about CERN, why cannot we pull out of CERN?

(*Sir John Cadogan*) Because Government policy is that we must take part in this great experiment.

112. How does the Government justify that policy?

(*Sir John Cadogan*) Because we are bound in as a treaty and British Governments through the years do not lightly withdraw from treaties, particularly with our European partners. That is my reading of it.

Sir Trevor Skeet

113. Nobody has pulled out?

(*Sir John Cadogan*) I am not here to justify it.

114. Of all the members none have pulled out of CERN. I think Spain did at one stage and then came back again, but we would be the only country that you recommend should pull out of CERN in order to satisfy the rest of science, while all the other European states remained in it?

(*Sir John Cadogan*) With respect, sir, I am not recommending that we pull out of CERN.

115. No, but your advice—you are in a position to advise Government?

(*Sir John Cadogan*) I am not recommending that we pull out of CERN. I am recommending that we get a better deal.

Chairman

116. From what you have already said, Sir John, it is clear that other participants in CERN share almost precisely the views of the British that this is a certain experiment which is running away with far too much cash for far too little return. Now you mentioned the three and that for some reason the voting did not give you a majority, but surely the chances of actually getting a reduction must be to get more than three. You must get some of the small ones for whom presumably the subscription is even more proportionately severe than perhaps the British one is for the United Kingdom. Dare one say, what are the plans to try and seek a greater corporate commitment to reducing? Obviously enlargement by getting Japan or America in is another way of reducing our burden, but what are the directions in which you might be seeking a reduction?

(*Sir John Cadogan*) I will be talking, and my colleagues will be talking, seriously. They know we mean business because they have seen us before. We will be talking to our partners, the partners who are

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SIR JOHN CADOGAN, DR KEITH ROOT
AND MR ADRIAN CARTER

[Continued

[Chairman Cont]

most vulnerable in the same way and we will be explaining the intolerable position which is approaching. I think we should not disclose any other tactics.

Chairman: Right. Just looking round my colleagues I think we have completed that. Sir John, we have reached the end of our schedule for which I

am very grateful and thank you for extremely robustly dealing with our questions, for raising a significant number of issues and providing a lot of important evidence to us. We are very grateful to you and your colleagues for coming here and thank you very much indeed.

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