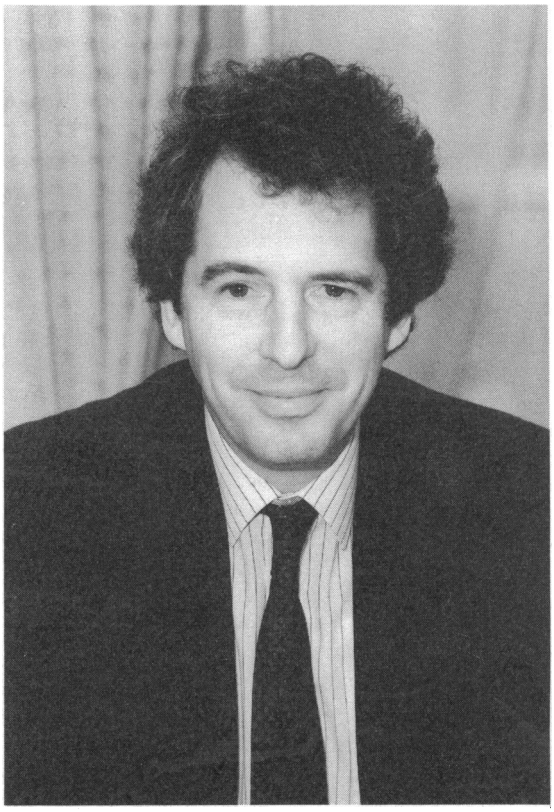
William Waldegrave on science policy

Richard Smith

William Waldegrave has had responsibility for science since the last election. He is currently preparing a white paper on science that will be published next spring. Richard Smith spoke to him about his new job, his thinking on science, and his plans for the white paper.



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RS: Why did the government decide to appoint a cabinet minister with responsibility for science?

WW: The British presidency of the European Community was the immediate reason. It's always been odd when we've had the presidency that we've had no minister of research and development to take the chair at the meetings of science ministers. More importantly, there is such a big schools agenda now that the old argument that science didn't get enough attention has taken on more force. Then the prime minister was clear that he wanted to raise the profile of science and technology in our culture.

RS: What about the economic argument—that having a solid science base is essential for the future of the British economy?

WW: We've always believed that, and it's becoming ever more important. But I think that the prime minister was sensitive to the arguments of morale and leadership. It's never going to be easy to find more money, but if people feel that they have somebody speaking for them even hard decisions are easier to face.

State of British science

RS: Many scientists are very depressed at the state of British science. They think that we had something special that has been seriously weakened through lack of leadership and commitment from government and through underfunding. The data on the decline in number of Nobel prizes won by Britons and in the British share of worldwide scientific publications seem to support that. Do you think that's a correct view of British science?

"The Prime Minister was clear that he wanted to raise the profile of science and technology in our culture."

WW: No, I don't. You can look at it another way. If you try to think of things where Britain is in the top three then there are very few of them, but you can make a good case for arguing that Britain is one of the top three science nations. In spite of our economic power being much lessened, we are still a top table player at science.

Clearly the exponential growth in the possibilities and in the expense of certain kinds of science is putting the system under more and more strain. That is why I'm going to have to address in my white paper whether we can maintain the width that we have had in the past with the quality. We contribute something like 4·5% of world science, and clearly there is no point in contributing 4·5% of second rate science. Particularly in basic science, the quality must be top rate. I'm tremendously anxious that quality is maintained. That leads to the difficult question of where we should concentrate.

But in response to your question I do accept that there is a problem with morale, although it's a little bit like morale in the health service in that whenever you meet people and get them talking about their subject their excitement is overwhelming. It is a difficult time: people are not highly paid, and equipment is often scarce. But there are still good people full of enthusiasm for their subject.

Basic and applied science: too simple a division?

RS: What does the government hope to achieve with its science policy? What will be the balance between research to increase knowledge and research to produce a financial return?

WW: Here is a proposition which I want to test: the old distinction between pure and applied science is too simple. I'm not sure that the difference between basic research driven by curiosity and strategic research is as clear as I used to think it was when I worked for Lord Rothschild. People like Thomas Kuhn seem to me to give a clear account of how science goes: even the purest people have in the back of their mind the paradigm of what is relevant and interesting now. And the shift, for instance, of good people into the biological sciences may not be because they have an application in mind—but because they know that it is a fertile area.

So one of the questions I think we have to address is whether there is too much inertia in the system, which is preventing people moving into fertile areas. That

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raises the difficult problem of identifying other areas, which although still intellectually exciting are not going to be where the best scientists map out whole new areas. I accept that there are types of research where you don't know what the result is going to be, but I think that there are people working right at the frontiers of biological research who are thinking that if A and B turned out to be true then they could think of a hundred useful things to do.

RS: Does that mean that rather than using the possibility of financial return as a criterion for funding research you will try and put money where the science is hot?

"You can make a good case for arguing that Britain is one of the top three science nations."

WW: We are now talking about the basic end, of course, and we will want to fund research that has clear applications. But generally that is exactly right. It is not meaningless to talk of times in basic science when there is one of Kuhn's paradigm shifts—and that is now happening in the life sciences.

RS: But doesn't that happen anyway with science? What's it to do with funding?

WW: Yes, but since we have limited resources we have to ask whether we are spending too much sketching in the almost completed picture of something that isn't now so productive. Should we not be concentrating resources on where the paradigm shifts are occurring? The life scientists, for instance, have very plausible stories about a whole range of applications.

Developing a strategy for science

RS: Do you hope with your white paper to develop a coherent strategy for science?

WW: I think that there are certain areas where we need a strategy. Thus I think we need a more coherent strategy for people. We're in a bit of a muddle about how we handle the research career. What it is, how long it is, how it's supported, and how it's related to teaching? I'd like to get that sorted out. That is of course very much to do with John Patten [secretary of state for education], and a point I want to make is that I have very close relationships with John Patten's and Michael Heseltine's [president of the board of trade] departments.

"We're in a bit of a muddle about how we handle the research career."

RS: So you are going to devise a strategy for people?

WW: I'd like to, but it's easier said than done. I certainly don't want to devise a detailed plan for British science for the next 10 years, but at a higher level of generality it may be right to say—after taking wide soundings—that these look like the sort of areas where we are going to concentrate resources. People will then know where we are going.

RS: I didn't mean a strategy in the sense that we will do a lot of this sort of science and not so much of that, but more that we will have a strategy for people, a strategy for raising the profile of science in our broader society and links into education.

WW: That's the other one. It's nebulous. But it's absolutely vital that government goes on, year in year out, talking up the importance of science and technology so that it feeds back to youngsters.

It's funny peculiar, but I recently met Heinz Riesenhuber, the German minister of science and research, and even before I started to talk to him about the difficulties of developing science policy in a country where you don't have much money or a science culture he talked about the same problems. It's a worldwide problem.

I think that actually we haven't done too badly in Britain. The prestige of the Royal Society and our good televisual science have all helped, but we shouldn't take it for granted.

RS: Is there going to be an attempt to guide science—to set more explicit priorities as the National Institutes of Health [NIH] is doing at the moment in the United States?

WW: I'm interested in what NIH is doing, but I think that it will be self guidance. Several people in the science community have advised me to look at the way in which the United States generate scientific consensus. When I come to look at what is the easy part to change—the institutions—I'm interested in that idea of getting a very powerfully based, sort of super peer group, view of the scientific future like the one that NIH has.

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RS: So out of that might come the idea, say, of concentrating on the life sciences?

WW: I think that they promote themselves because we have real talent—and we have an industry. And that's another sensitive point that we must acknowledge. We are not now going to create a consumer industry that is going to rise up and knock out Japanese competitors. But we do have a pharmaceutical industry that is good as any anywhere. And if you've got the people to do the developing and the marketing then it's not irrational for us to accept that reality.

RS: And does that go right down to basic science?

WW: I think it does, and some of it, of course, is cause and effect. I'm keen on reinforcing success.

RS: So that's bad news for physicists?

WW: That's the other side, and I don't want to cause alarm and despondency yet because we haven't come to any decisions. But there's no point in feeding the British mythology of how we invent things that are never developed by inventing things that are clearly never going to be developed. Let's see where our strengths are and reinforce them.

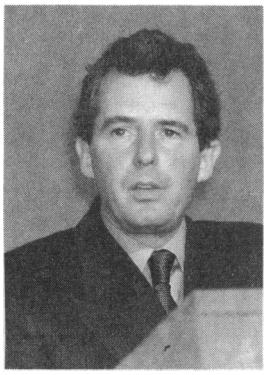
Concentration of institutions?

RS: So you are talking about concentration and direction?

WW: I am a bit.

RS: You know that scares scientists?

WW: Yet, but there are two sorts of concentration—in places and in subjects. At the moment I'm inclining not to concentrate institutions too much. I think it's good that institutions should have some overcapacity to fund green shoots research. But when the green shoots have grown up into saplings and costs have moved up an



order of magnitude then we have to ask, "Where's the customer? And what will be the outcome of us giving you this expensive machine?" Against the background of the continuing economic problems of the country we've got to argue that. But scientists shouldn't panic because the very purest research is often very cheap.

RS: What about the idea of concentrating universities into three types—those that do internationally competitive research across many fields, those that do some internationally competitive research, and those that do just a little research to support teaching?

WW: The problem with that is that the green shoot chap may turn up in the wrong place. It may be right—as the vice chancellors of big universities say to me—that bright chaps follow the money. That may be fine once they've got into the science community, but we've got to have the capacity to find bright people who pop up in other places. It's at the next stage where it's sensible to have a concentration of well founded laboratories rather than a whole lot of ones that are all out of date.

So I wouldn't want to see places that didn't have the capacity to pick up bright people, even if they say to them that they will have to go on elsewhere for their next degree. I don't want rigid graduations. But, as in my last job, you don't want everywhere setting themselves up to do heart transplants. That is silly. There are some things where you have to take decisions and plan things.

Reforming institutions

RS: What about the idea that the research councils might be replaced by one large council?

WW: I recognise the arguments about the dangers of boundaries, but I have an instinctive worry about the speed with which we turn institutions upside down. On the whole, I don't find people criticising the work done by the research councils. Some people say that the missions are a bit out of date, but the concept of research councils serves us well.

The level to me where it looks more sensible to look for reform is the level above—where we now have the Office of Science and Technology, the Advisory Council on Science and Technology, and the Advisory Board to the Research Councils. This office has got to be a proper ministry of science, taking some decisions and answerable to parliament.

"I have an instinctive worry about the speed with which we turn institutions upside down."

RS: Do you mean we don't need all those institutions?

WW: That's what a lot of people are saying to me. They were set up for a different set of circumstances where there was no ministry of science.

Funding and evaluating science

RS: What about money for science? [This interview took place before the autumn statement on public spending.]

WW: Everybody this year is going to find money terribly hard to get. It's going to be very, very tough.

RS: But as the government has set up a cabinet minister with responsibility for science won't it send out a mixed message if science is hammered?

WW: I'm not promising anything at the moment.

RS: What about shifting funds from military research?

WW: That has, of course, begun, and it must go on. Again it's easier said than done because it's often about people.

RS: Wouldn't you like to speed it up?

WW: I'd love to have the money, but the defence budget has its pressures too.

RS: Are you going to encourage the evaluation of science?

WW: I have begun to look at the cost effectiveness of science. What do you get for your research budget and how do you measure it? There is more to do. But my budget is going to be under pressure, and I don't want to be spending money on metasubjects rather than on the subjects themselves.

"Now that we have specific [financial] flows for research within the NHS it's important that those flows are not diverted into supporting ordinary service work."

RS: Which is how the scientists feel.

WW: Yes, but if there are people out there with clever ideas can I have them on the traditional postcard?

RS: So you need to be convinced that those sorts of studies themselves have value?

WW: As a non-scientist, it's easy for me to be too interested in subjects which mean more to people like me and yet which may not produce a rich harvest.

Uptake of research

RS: What about encouraging the uptake of research? There is a feeling that good work gets done and then nothing is made or nothing changes as a consequence?

WW: There's a whole range of pull through programmes, some of which are more successful than others. I'm interested again by how this is a worldwide problem, but it does mean that this office has to have very close relationships with industry, people who can make things, and people who know what markets are available. In particular, I think we may have undervalued in this country the small niche, high tech company—very high value added. A galaxy of those produces a lot of money quite soon, and I shall be particularly interested in the support systems that we have for them.

RS: Do you think that you must say to the research councils that you have a responsibility to push through the results of your work into either changing medical practice or producing products?

WW: When it comes to products I think that it must be the customers doing the pulling. I think that sometimes we've made the mistake of pushing too much from the research end.

European research

RS: What do you think is the place of European research? There is a feeling that if we got together more in Europe we might be able to compete more effectively with the Americans and Japanese.

WW: I'm sure as ever I was that that is basically right. We should be doing some of the big generic things across Europe. I think that it's extremely important to get the European science programme better run and better organised so that it carries more confidence in the science community.

RS: Does that mean that eventually most of the funds that the British government puts into research will go through European bodies?

WW: No. We should use subsidiarity here as much as anywhere: we should do at a European level only what needs to be done at that level.

Coordinating medical research

RS: Can we talk specifically for a moment about medical research? Something that people are confused about is how exactly the MRC and the research and development arm of the NHS are going to work together.

WW: Firstly, I greatly welcome the development of a research and development capacity within the NHS. I think that's a major step forward. I suspect that it will mean that the NHS will begin to be a much more organised customer of the output of the MRC and other institutions. That might make Rothschild work in a way that it hasn't. I guess that Mike Peckham [NHS director of research and development] will be down towards the applied end, the end closer to patients, so that it will sort out better responsibilities. He should be doing a lot of development work, with the research council supporting the science base.

RS: Eventually the NHS research and development arm will have a bigger budget than the MRC. Will no money be taken away from the MRC? Will the whole pot for medical research be much larger?

WW: I don't think that Mike thinks that there will be any less money for the basic science base. I think that he's got his other frontier to watch—in that there's a lot of people around who may say that they are doing research but are not. Now that we have specific flows for research within the NHS it's important that those flows are not diverted into supporting ordinary service work.

RS: More and more research is being funded by medical charities. Does this mean that in some sense medical research is being privatised?

WW: I just think that the charities are a terrific extra national resource.

RS: Do you think that there need to be better mechanisms to coordinate the research funded by government and the charities?

WW: Yes, I do. That is also a role for this department.

RS: Finally, do you think that you are the right person to be responsible for science in Britain?

WW: What a question. But, yes: I can't think of a job I'd rather have. It's a tremendous opportunity to set up this department and produce a white paper that might have a profound effect on British science.

London after Tomlinson

The Tomlinson report and postgraduate medical education

J D Swales

This is the eighth article in our series looking at the issues highlighted by the Tomlinson report into London's health care and medical research and education.

The postgraduate hospitals of London grew up in the nineteenth century and offered a unique national specialist service. Since then specialist services have developed in undergraduate hospitals throughout Britain as well as in London, but the postgraduate hospitals have nevertheless preserved their high levels of staffing. Although numbers of medical posts in the provinces have grown, this has not been by redistribution of London posts but merely differential growth. The fact identified by Tomlinson—that Londoners are not receiving the most appropriate clinical care—is in fact the strongest argument for changing postgraduate medical education. Such education needs to be rooted first in clinical care, though Tomlinson underestimates the importance to education of such care being sited in a shared environment with strong scientific activity.

"A sharp remedy but a sure one" remarked Sir Walter Raleigh on contemplating the axe. Staff of London teaching hospitals surely share the former if not the latter sentiment on hearing of the radical surgery recommended by the Tomlinson report. Nevertheless, despite understandable anxiety it seems probable that at least some action will be taken along the lines proposed. If this is the case, there will clearly be important consequences not only for patient care but also for the other roles which hospitals play in teaching and research.

Interwoven with patient care

The first observation to make is that these activities are tightly interwoven. Clinical research and teaching cannot be divorced from patient care. If they could, the raison d'être of the teaching hospital would disappear, and medical schools could be removed to pleasant green field sites. This is an obvious point and it is regrettable that it has to be made, but it is often forgotten or ignored.

The sheer magnitude of the National Health Service as an operation and the complexity of its functions creates obstacles to change. Any attempt to correct one problem immediately has an impact elsewhere—for instance, on research, training, or manpower. There is an unfortunate tendency to isolate problems in the face of such difficulties. Proposals are made to improve standards of care, training, or career structure. It is then pointed out that recommendations aimed at resolving one problem have an adverse impact elsewhere. Under the circumstances the status quo often appears the best of a series of unattractive options and nothing alters until a threshold of discontent is reached and rapid change is effected, often with damaging consequences.

"If clinical work has somehow become dissociated from teaching . . . the primary aims of the institution have become confused."

I do not believe therefore that postgraduate education can be considered in isolation. It also should be axiomatic that patient care and well being are the primary purpose of the health service. Some might regard this statement as banal, others as wildly romantic, but it is a necessary truth.

Clinical teaching and research are important parts of

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