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PREM 19/1047

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The Appointment and Role of the Chief Scientist, CPRS.

GOVERNMENT

MACHINERY

MARCH 1981

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PREM 19/10/87



10 DOWNING STREET

From the Principal Private Secretary

SIR ROBERT ARMSTRONG

Thank you for your minute of 5 January (A083/0016) covering a paper from Professor Ashworth about his reflections on the role and function of the CPRS. I have shown this to the Prime Minister, who read it over the weekend.

FERB

17 January 1983

010

Weekend box

Prime Minister

Ref: A083/0016



Not priority reading;

but some quite interesting

thoughts on the roles of and

use of advisers on pages

14-18.

FERB

MR. BUTLER

If and when the Prime Minister has a ^{13.1.} moment, she may like to glance at the attached copy of a paper from Professor J.M. Ashworth, who was formerly Chief Scientist in the Central Policy Review Staff; it contains his reflections on the role and function of the CPRS. I do not know if there is anything very new in it until you get towards the end.

Robert Armstrong

5th January 1983

ON THE GIVING AND RECEIVING OF ADVICE (IN WHITEHALL AND SALFORD).

PAPER FOR THE MANCHESTER STATISTICAL SOCIETY, 16TH NOVEMBER, 1982.

J.M. ASHWORTH.

In the past 14 months I have had the unusual experience of being translated from the post of Chief Scientist in the Central Policy Review Staff (CPRS) in the Cabinet Office - where I was responsible for seeing that the Cabinet obtained, when appropriate, suitable scientific and technological advice - to the post of Vice-Chancellor of Salford University - where I have had to shoulder the responsibility for managing an Institution in the crisis that resulted from the decision of the University Grants Committee to cut its recurrent grant by 44% two months before I became Vice-Chancellor. I have thus experienced a sudden transformation from being an adviser to those (Cabinet Ministers) who have to manage crises to being, myself, a recipient of advice on how to manage a major crisis. I do not think there can be many who have had such a rapid translation from a position of power without responsibility to what, as any Vice-Chancellor will tell you these days, often seems like a very visible position of great responsibility without some very necessary powers! When I was invited by your Secretary to talk to you tonight it occurred to me that this was the perfect excuse and stimulus to reflect on the problems of giving and receiving advice in crisis situations and - if they will forgive the presumption - for offering a series of "do's and dont's" to those who find themselves either at the giving or the receiving end. But first, let me begin by briefly describing the job of Chief Scientist, CPRS, since I imagine that whereas most of you have at least some idea of what a Vice-Chancellor is and does, you have only the haziest of notions of what the CPRS is and does.

Many of the misunderstandings about the CPRS stem from the unfortunate way in which it has become known as the "Government's Think Tank". Think Tanks are an

American invention. The first was the RAND Corporation which was brought into being to help the United States Military (particularly the Air Force Staff) work out the strategic doctrines appropriate for the design and deployment of nuclear weapons. Subsequently, the remits given to the RAND Corporation widened and others - such as the Brookings Institution in Washington - were set up to address specifically civilian tasks. The characteristics of a classical Think Tank of the RAND/Brookings Institute kind are:-

- 1) a commitment to objective, interdisciplinary analysis of policy and policy making
- 2) a critical mass (say 15-20) of full-time professional staff working in teams with full access to all or nearly all of the existing information on the issues under examination
- 3) considerable, if not quite complete, freedom to carry out research focused on the evaluation of basic policies rather than the more efficient implementation of current policies and to publish the results and
- 4) dependence on a variety of funding agencies for research contracts with Government(s) as only one (if often the major) client.

The Central Policy Review Staff (CPRS) satisfies the first two of these criteria but not the last two. It is, I think, best considered as a hybrid organisation mid-way, as it were, between a Think Tank sensu stricto and the kind of "Brains Trust" or informal ad hoc group of "wise persons" that rulers have traditionally gathered about them. Professor Yehezkel Dror (to whom I am indebted for this analysis) has called attention to the proliferation of such units (which he terms "policy analysis units") amongst governments in the past twenty years.

The distinction between:

Think Tanks
Policy Analysis Units
Brains Trusts

is a useful one and has been somewhat confused by referring to the CPRS as the 'Government's Think Tank'. It is interesting to see, by the way, how in recent weeks the Prime Minister has been seen by a number of commentators to be complementing the CPRS by a traditional "Brains Trust" comprising so far, a trusted economist (Professor Alan Walters), diplomat (Sir Anthony Parsons), management expert (Sir Derek Rayner) and defence expert (Sir Frank Cooper). But I am being carried a little away from my main theme for tonight; let me return to the CPRS - what it is, what it does, and how it does it.

Giving Advice - the Central Policy Review Staff (CPRS).

The CPRS was created by Mr. Heath who had been struck by the contrast between his harrassed existence in office as a Minister, when he found himself "bogged down" in administrative detail, and his comparatively tranquil existence when out of office in Opposition and was able to think widely and strategically. His notion of the CPRS was very much that of a body whose role was to remind a Prime Minister and Cabinet harried by day-to-day problems of Government that they had a collective, strategic view formed whilst they had been in opposition and to which they should cleave whilst in Government. The White Paper "The Reorganisation of Central Government" (Cmnd.4506) published in October, 1970, said of the CPRS that:

"Under the supervision of the Prime-Minister, it will work for Ministers collectively; and its task will be to enable them to take better policy decisions by assisting them to work out the implications of their basic strategy in terms of policies in specific areas, to establish the relative priorities to be given to the different sectors of their programme as a whole, to identify those areas of policy in which new choices can be exercised and to ensure that the underlying implications of alternative courses of action are analysed and considered.

The new staff will not duplicate or replace the analytical work done by departments in their own areas of responsibility. But it will seek to enlist their co-operation in its task of relating individual departmental policies to the Government's strategy as a whole. It will, therefore, play an important part in the extended public expenditure survey process described below, and it will also be available to promote studies in depth of inter-departmental issues which are of particular importance in relation to the control and development of the Government's strategic objectives."

It is interesting to reflect that of all the organisational innovations described in Cmnd.4506 only the CPRS is still in existence. The reason for this is partly that the remit described above is, in fact, extremely general and has thus allowed the CPRS to adapt as circumstances, and Prime Ministers, have changed but mainly, I believe, because the first Head of the CPRS, Lord Rothschild, established certain conventions and working practices which have meant that that potential for flexibility has been seized on and exploited by his successors.

Size and Composition.

The first of these conventions is size. The CPRS usually has between 15 and 20 members (a number which can be fitted conveniently around the large table which dominates the Head of the CPRS's office and which provides the focus for much of its activities as well as for the regular Monday morning staff meeting). About half of these are career civil servants on secondment from their departments and the other half are recruited from outside the Civil Service - from universities (as I was), industry, the City, local government and international organisations. This results naturally in a number of disciplines (scientists, social scientists, accountants, economists) being represented and also in a non-hierarchical structure. The normal length of stay in the CPRS is between two and three years and, most important, at the end of this time members return to their parent organisations (or departments in the case of Civil Servants). For practical, career reasons this means that the average age of the CPRS will be in the mid-thirties to early forties.

The staff members of the CPRS are thus not in competition with one another for promotion; the CPRS is not, of itself, a promotional posting (although the subsequent careers of members of the CPRS suggest that few careers have been harmed by the experience!) and thus a mutually supportive and collaborative work style has evolved naturally. Further, since it has not proved possible

to develop any rational means of calculating what a member of the CPRS should be paid the decision was taken to adopt the rule that whilst in the CPRS its members should "neither win nor lose" financially. Since a 35 year-old whizz-kid banker or accountant is usually paid far more than a 35 year-old University lecturer (or even Professor) this has resulted in some curious anomalies but another potential source of friction, rivalry and tension has been thereby removed.

Traditionally and, on occasions notoriously, the CPRS has also tried to ensure that between a quarter and a third of its staff are female. In part this reflects the way in which the Civil Service has been a career of choice for clever women graduates in the past decade but, in part, it is a recognition that such a policy provides a useful counterbalance to a bureaucracy which at its highest levels is virtually exclusively male.

I would strongly advise any ruler or top executive/decision-taker who wanted to establish near him/^{her}a policy advice unit of the CPRS kind to think seriously of emulating what I believe to have been the key features of the composition of the CPRS namely:

- (1) small size, i.e. 15 - 25
- (2) average age in the mid thirties
- (3) average residence time short (2-4 years)
- (4) a non-hierarchical and non-competitive work environment
- and (5) at least a quarter of the staff members should be female.

Work Programme.

Let me turn now from the size and composition of the CPRS to the work it does. I find it much more difficult to make useful generalisations on this topic. In part this is because in the five years that I was a member of the CPRS I served under two Prime Ministers (Mr.Callaghan and Mrs.Thatcher), two

Heads of the CPRS (Sir Kenneth Berrill and Mr. (now Sir) Robin Ibbs and two Secretaries of the Cabinet (i.e. Civil Service Heads of the Cabinet Office; Sir (now Lord) John Hunt and Sir Robert Armstrong). The day-to-day life of a member of the CPRS is determined by the relationship between the Prime Minister, the Secretary of the Cabinet and the Head of the CPRS; how they see their roles; what sort of help they want or need (by no means the same thing) and how they interact together. In addition, of course, events take their course; there is a natural rhythm to a year's work (building up to a major "panics" before budgets, or recesses or Summits or Fridays or whatever) as well as to an administration's life cycle (elections cast long shadows, in all directions and relationships, between the Prime Minister and his/her Cabinet colleagues or between the colleagues themselves are always changing as reputations are mysteriously made or lost). All this makes generalisation difficult or trite. But let me try.

A Unit like the CPRS should be given a wide range of tasks and it should always be kept very busy. The broad remit of Cmnd.4506 enjoined the CPRS to "work for Ministers collectively" - not for the Prime Minister notice, or any sub-set of Ministers, but for the Cabinet as a whole. All other civil servants work within a departmental framework and work ultimately to and for an individual Minister and within his/her policy framework. The CPRS is thus uniquely privileged in being able to transcend this limitation but it nevertheless has, in offering advice, to be seen to be helping individual Ministers to relate their policies and decisions to the Government's strategy as a whole. This task can be carried out in a variety of ways with the balance, or mix, varying from time to time and from administration to administration.

Strategy reviews.

At regular intervals the CPRS attempts to take stock, across the board, of

the problems facing the Government both in the shorter and longer term. The results of this exercise can be presented to Ministers in a variety of ways depending on taste and circumstances. Alternatively these reviews can be used merely to keep track of the CPRS's own work programme and to highlight gaps, tensions or omissions in the policy making process. Often such reviews suggest subjects which may require study in depth; or they can give early warning of decisions which are likely to be coming before Ministers and on which the CPRS should be prepared to offer specific advice.

Major studies.

Normally the CPRS is involved in two or three major studies at any one time. The subjects and results are usually kept confidential but examples of exceptions to this general rule are Energy Conservation (1974); the Future of the UK Power Plant Manufacturing Industry (1976); Population and the Social Services (1977) and Education Training and Industrial Performance (1980). These reports are similar to the output of a Think Tank of the classical RAND/Brookings Institute type and their production helps build up, amongst the members of the CPRS, a specialist competence in certain policy areas. This is necessary both for other activities and for the maintenance of a degree of professionalism in certain kinds of policy analysis. The initiative for these in-depth studies may come directly from Ministers (often a Cabinet committee) or from the CPRS itself.

Programme analysis and review.

Cmd. 4506 initiated a formal system of stock taking (the PAR system) whereby major policy areas, often defined in budgetary terms, were to be reviewed by the relevant department(s) in conjunction with Treasury, the Civil Service Department and the CPRS according to a regular cycle. Enthusiasm in Government for a formal PAR system has waxed and waned with the years but the need for

some sort of regular review process is generally accepted. The difficulty has been to find a device (or set of devices) whereby enthusiasm for the review process can be kept alive and periodically rekindled. The trouble is that such reviews are often technically very difficult to do, take up an immense amount of time and frequently produce results which are of no great Ministerial interest. At present there seems to be a distrust for the formalities of the PAR system and a greater reliance on ad hoc reviews and individual entrepreneurship as encouraged by Sir Derek Rayner's efficiency audits - with their "Rayner's Raiders" overtones. It is sad, but I suspect inevitable, that these two styles should be seen as mutually exclusive.

Preparation of collective briefs.

The CPRS sees the papers prepared for discussion in Cabinet and in Cabinet committees and it decides whether or not to prepare a brief for Ministers on any issue raised in these papers. Much of the excitement and a lot of the tension of being in the CPRS stems from the work involved in the preparation of these briefs. The aim of collective briefs is to ensure that discussions in Cabinet and Cabinet committee meetings do not degenerate into arguments between the two or three Ministers with a departmental axe to grind whilst a silent majority - insufficiently briefed by their own departments to realise what the fuss is all about or to appreciate the consequences a decision one way or the other may have for the Government's general strategy - looks on. An important part of the CPRS's task is to generate amongst Ministers a demand for briefing of this kind - and no more presumptuous (or potentially dangerous) task can be imagined. For on any one issue there will be at least one Minister who will not regard the CPRS brief as a help to good Government and, in time, all Ministers (including the Prime Minister) can be expected to harbour the thought that the CPRS has outlived its usefulness. The fact that the CPRS has survived demonstrates, I suppose, better than anything else that the

Algebraic sum of these positive and negative Ministerial reactions has been positive. It all makes for a certain (creative) tension, however!

Other activities.

The CPRS is physically and constitutionally part of the Cabinet Office and depends on the Cabinet Office secretariat for much routine information. In return the Cabinet Office secretariat sometimes will look for help from the CPRS in areas where there might be particular expertise - this was especially, but by no means exclusively, true of scientific and technological matters. In addition members of the CPRS are in constant contact with the civil servants in other departments; obtaining information; following up Ministerial decisions; keeping in touch with policy developments and so on. All this takes time, and valuable time, away from "Think Tank" activity but without it much of the CPRS work would appear even more peripheral and remote from the day-to-day hurly-burly of departmental administration than it does at present to the hard-pressed Minister or civil servant.

Special role of the CPRS in Science and Technology.

I was unique amongst members of the CPRS in having a special title: Chief Scientist. It is, I suppose, a tribute to the perceived importance of science and technology and the strength of the science lobby, that I should have been singled out and that we did not also have a Chief Economist, Chief Sociologist etc. - although it would often have been possible to identify amongst colleagues in the CPRS those who could have been so described. It was true, of course, that the special title carried with it some special responsibilities. I had a specific responsibility for some aspects of our scientific relationships with foreign countries, for example, and also had a particular responsibility for overseeing the work programme of the Advisory Council for Applied Research and Development (ACARD). I was also ex officio a member of a number of

committees responsible for various aspects of our national scientific and technological policy such as the Advisory Board for the Research Councils (ABRC) and the co-ordinating Committee of Chief Scientists and Permanent Secretaries designed to fill that "gap at the centre" which has been identified as a fundamental weakness of the highly decentralised policy making system established as a consequence of the Rothschild Report in 1972.

In acquiring a Chief Scientist the CPRS thus got much more than another scientifically qualified member with a fancy title. It now had formal access to a standing Council (ACARD) of extremely distinguished (and, as it proved, hard working) industrial technologists and representation on ABRC as well as the co-ordinating Committee of Chief Scientists and Permanent Secretaries and a diversity of international bodies. In bureaucratic terms this carried with it the opportunity for a different kind of influence as well as the implication of a changed style of work - at least as far as scientific/technological issues were concerned. In 1976 the members of the CPRS were rather apprehensive about what this would mean for the Unit as a whole but, as things turned out, I believe that this added dimension to the CPRS's activities strengthened the organisation considerably. The ACARD reports:

The Applications of Semiconductor Technology (1978)

Industrial Innovation (1979)

Joining and Assembly : the Impact of Robots and Automation (1979)

Technological Change : Threats and Opportunities for the United Kingdom (1980)

Computer Aided Design and Manufacture (1980)

R & D for Public Purchasing (1980)

Information Technology (1980)

Biotechnology (1980) - a joint report with the Royal Society and ABRC.

Facing International Competition (1982)

The Food Industry and Technology (1982).

are a tribute to the industry of those concerned and a good indication of the sorts of issues which were occupying the CPRS in the field of science/technology policy at the time. The knowledge built up during the work leading up to those publications was of great value to the CPRS in its other work as, in my view every bit as useful, was the public response to ACARD reports. It is often forgotten that Ministers read newspapers as well as official papers and the message of the latter can often be usefully complemented by the opinions of the former (especially when amplified by TV as happened in 1978 with the brilliant BBC Horizon programme "When the Chips are Down" on the possible applications of semi-conductor technology to our social, economic and industrial infrastructure). This influence was reciprocated. I was scrupulously careful to avoid being seen to set up a sub-unit within the CPRS and so the scientific/technological work of the Chief Scientist and ACARD often strained a strict definition of "applied R&D". This led to some tensions within the bureaucratic machine but, fortunately, those who argued for a strict and narrow interpretation of ACARD's remit lost the argument. At this level of policy making there is, in my opinion, no point in pretending that it is possible to draw a clear distinction between 'fundamental' or 'applied R&D' and between the latter and great chunks of 'industrial/energy/environmental policy'.

Work style.

The above makes a forbidding list of activities and different Cabinets (and Prime Ministers) or the same ones at different times only required a selection. Individual members of the CPRS always tried to keep a balance between their work on short, medium and long term policy issues - even if Cabinets did not. A number of rules for conducting studies were also discovered (sometimes painfully) which I would recommend to anyone trying to emulate the CPRS.

These were:

- (i) never have a one person team;
- (ii) never let a study take longer than three months (at the very most);
- (iii) never forget the opportunity costs of having a third or more of the CPRS involved in any one study and avoid such studies if you can (or get someone else - like ACARD - in to help);
- (iv) always ensure that an individual has a mix of types of work;
- (v) ensure that someone who is a "senior" in one team is simultaneously a "junior" in another;
- (vi) nourish the contacts individuals have with genuine "Think Tanks" outside the bureaucracy - especially where they are looking at policies or areas which go against the declared policy interests or prejudices of Ministers i.e. be a little "counter cultural" but do not invest much CPRS staff effort or time in this;
- (vii) be resigned to the fact that for a body like the CPRS there can be no rules and that all of the above will be broken at one time or another.

It is difficult for a player to see much of the game or to judge how effective his team is really being. Certainly I would not presume to judge how effective the CPRS has been over the five years I belonged to it. It was extremely hard work, tremendous fun and a marvellous education - I wouldn't have missed it for worlds but that is hardly an evaluation. I think the best I can do is quote Sir Kenneth Berrill's words at the conclusion to his article on the CPRS in 1977: "CRPS believes that in various ways whether by long-term strategy papers, major studies, collective briefs, participation in PAR's or interdepartmental committees it has, at a relatively, small cost, both helped to improve the machinery for decision-taking at the centre and helped departments to relate their individual policies to the Government's strategy as a whole."

Receiving advice.

So much for the CPRS and the problems associated with giving advice. What about the problems of someone receiving advice? The people I have in mind are those who are visibly and publicly accountable and responsible for a discrete organisation - the Rulers of countries, the Bosses of commercial firms, Vice-Chancellors of universities, Headmasters or Headmistresses of schools and so on.

The first, and in some ways by far the most important point to make is that such people have to be answerable for an enormous range of different activities - investment decisions, personnel management, customer/client complaints, marketing/PR policies and so on and on and on. They will, of course, be helped to cope with managing most, if not all, of these activities but if something goes wrong (or right) they are the ones that will carry the blame (or receive the congratulations). Two things flow immediately from this. Such people - let me call them "rulers" for the sake of brevity - receive or are told an immense amount of disparate facts, opinions, rumours, gossip, etc., which they must keep or discard and then shape or fit into some sort of manageable form. They will be offered and will need help with this but only they can know all the information that comes in and, in the last resort, only they can integrate it. Much of it will be confidential (personal records of employees, secret service reports, marketing information of competitors' products etc.) and a frighteningly high proportion will be uncertain, of doubtful or unknown veracity or just plain wrong. This means that rulers are inescapably lonely and thus are usually given kinds of support other than the purely intellectual. Thus the Prime Minister, Vice-Chancellors, Directors of Marks & Spencers, etc. have houses and chauffeur driven cars provided for them. They embody or personify the organisation they "rule" and thus have to participate in representational or ceremonial functions for which they are often given special clothes, (e.g. academic or ceremonial dress), a special life style and are effectively

prevented from certain kinds of acts or ways of living. The apocryphal "perfect" newspaper headline "Bishop in Sex Change drama dashes to Palace" expresses what I mean perfectly. I do not think that such people need our sympathy - after all presumably they chose their jobs knowing what was in store - but they do need to recognise that because of their position they will be offered (and need) support of a variety of different kinds - intellectual, administrative/managerial, physical, emotional, political (with a 'p' or a 'P') - and nothing is more fatal than for them to muddle these up. Thus the CPRS was set up to give intellectual and administrative support to the Cabinet. It is ill-equipped to give political advice. Yet Cabinet Ministers have to deal with problems which always have a political dimension and are frequently tempted to expect that from the CPRS - especially if they have come to rely on and appreciate the intellectual advice they have been getting. Again I said earlier that 'rulers' in any sense are inevitably lonely people. All need some sort of emotional comfort and support and the spoils of office have traditionally always included the possibility of personal indulgences - power, as Henry Kissinger has recently pointed out, is the greatest aphrodisiac known - and President Kennedy was neither the first nor the last to capitalise on this. The temptation to look to wives, lovers, husbands, chauffeurs, hairdressers, old school chums and especially family relatives for advice and support in fields other than the emotional/personal is ever present and often disastrous. The temptation for a 'ruler' to trust his intuition or instinctive 'gut' feelings is always strong because of the uncertainty inherent in the data on which he or she has to base his or her judgements. Those who offer emotional/personal support and advice, whether they do it consciously or not, pander to that temptation because what they are interested in is the 'ruler' as a person not as the centre of a decision taking and making process.

There is a surprising lack of academic study of and advice directed at

Political rulers, although rulers of companies and similar organisations are somewhat better served by business schools and other organisations. Let me, therefore, try and draw up a list of "do's : and dont's" for such rulers. The most important I have already discussed -

- 1) distinguish and differentiate between the various kinds of support your organisation will provide (intellectual, emotional/physical, political, administrative/managerial) and never muddle them up
- 2) don't trust your intuitive judgements or gut reactions blindly - always check them with those whose job it is to give you intellectual support

It follows from the above that you should establish near yourself a group designed to give you this intellectual support and analysis. The CPRS was set up to do just this and most large organisations now have some kind of corporate planning staff within their ruler's office. Smaller organisations can adopt less formal devices but woe-betide the ruler who does not follow this advice - unless he is unusually far sighted or lucky he is condemned to be permanently surprised by events.

- 3) intereact closely with your staff, trust them and invest a significant part of your time in them. They must know your strengths and weaknesses, be sensitive to your worries, feelings and preferences and be privy to as much of your thinking as the conventions (or rules) of confidentiality allow.

This is easy to say and very difficult to do because all rulers like to give the impression of omniscience. Yet you have to admit to your staff that you

have made mistakes and errors (even if by hard work and opportunism you have turned them to ultimate advantage) because you and they must learn from them. There is also another danger in this process. Rulers, by definition, are confident (usually over-confident) people and thus will tend to constrain and restrain their staff to work within their own intellectual boundaries. These are always too narrow for the solution of the problems that will arise and, hard though it is, a ruler must insist on his staff doing at least a modicum of unconventional even apparently crazy thinking - a "Think Tank" that does not think the unthinkable from time to time is useless.

4) do not despise formalised methodologies

Just as the eye needs a telescope or microscope the better to see the distant or the small so the brain needs intellectual tools and instruments to handle complexity, face uncertainty and impose some sort of structure on "reality". Rulers distrust such things - it is a rare politician, corporate chairman or even Vice-Chancellor who is happy to expose his strategic thinking to sensitivity analysis, econometric modelling, simulation and gaming, decision tree analysis, alternative scenarios, issue mapping, breaking point or critical path analysis and so on. Often rulers are right to be distrustful yet such techniques can be powerful aids to policy analysis and to identifying the strength and weaknesses of proposed policies and actions. Like any tools they should be used with care and are neglected at the ruler's peril. Politicians who profess to despise the social sciences are either liars or fools. This is not to say that they should be expert or even familiar with any of these techniques but they should expect their staff to know of them and to use them when and where appropriate.

5) beware of "facts"; graphs that start at "now"; numbers without error estimates and simple solutions

Rulers have to deal with those problems and issues that others cannot or have not been able to deal with. This is a wearisome and often depressing business and the temptation to clutch at the simple sword with which to cut the Gordian knot is often overwhelming. Your staff must always remind you of the complexities, the ambiguities, the uncertainties and - even if they provide you with simplistic solutions for PR or other purposes - should always remind you of the different "realities" that lie behind the "facts" and "numbers" that you use.

6) weigh up the costs and benefits of ambiguity with especial care

Faced with the perils of an oversimplistic solution and the complexities of "reality" the temptation to do nothing is often considerable. There is always great merit in "masterly inactivity" and "do nothing" is an option which you and your staff should always explore. I was told, the no doubt apocryphal, story when in the Civil Service of the devout Permanent Secretary in the Treasury who thanked his God every night that his and the Chancellor's powers were so limited. Mrs. Williams, when talking of the successes and failures of the 1964 Labour government rounded on those baiting her with, "what you must remember is that any reform which does not achieve the opposite of its stated intention must be considered a success". The Civil Service, like any bureaucracy, is full of weary and battle scarred veterans of the battles waged by eager reformers. Of course, they have a point but I doubt whether Rulers should take too much notice of them. The attractions of doing nothing are usually so obvious and well presented by those who offer administrative or managerial support that they are unlikely to be overlooked and

If the Ruler is not to champion the innovative who will? In practice the attractions of doing nothing are usually evident in the short term whilst the benefits of change (if there are any) can only be enjoyed in the long term. Rulers are always having to make very difficult and painful choices between the short term and the long term; between the pleasures of doing nothing with the effort of successfully achieving change and the ever present attractions of ambiguity against the perils of precision. Given the inherent stability of the bureaucracy that surrounds a Ruler I would always advise that a Ruler should

- 7) be creative and innovative and always favour the long term over the short term

in the confident expectation that for much of the time those who press for the converse of this will (and probably should) prevail.

Finally, there are two maxims which are almost as important as my first - and as often go unobserved.

- 8) always plan for failure; hope for the best but have a plan for the worst. No position is more visible and exposed than the one at the top and
- 9) accept final responsibility.

Nothing is more demoralising for those who support a Ruler if they find themselves blamed for every failure and denied the recognition that comes from success. Since a Ruler is going to receive the public rewards of success

However, ill deserved his or her staff might feel these to be) it is only just that he should receive the blame for failure. Indeed one of the purposes of having Vice-Chancellors, Prime Ministers, Chairmen of Boards of Directors, Headmasters and Headmistresses and so on is that they can indeed carry away with them the burdens of failure and allow their institutions fresh starts and, hopefully, better futures. If Rulers should be committed to change it is perhaps only fitting that those ruled should be able to change their Rulers.

JMA/HP.
1.11.82.



9 Oct 1911

10 DOWNING STREET

Mr. White

Thank you
M.
20.

Dr. Nicholson
is in Geneva
tomorrow & Friday
so we have
rearranged for
Monday next at
15.15.

EJ.

20/11

My cancelled
@



10 DOWNING STREET

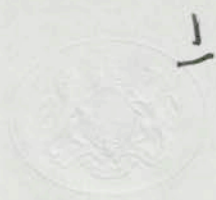
Mr. Whitmore

Confirmed
for 12 Noon
tomorrow,
Thursday.

C.S.

20/1

010



Prime Minister

Happy to see Dr
Nicholson?

Ref. A07186

MR WHITMORE

Yes not

RM
19.82

The Prime Minister has invited Dr Nicholson, the new Chief Scientist, CPRS, to her reception for industrial designers on 25 January. I believe that she has not yet met Dr Nicholson, and I wonder whether it would be useful for her to do so before the reception, so that she does not meet him as a total stranger on that occasion.

2. If you think that that would be a good idea I should be very happy to bring Dr Nicholson through and introduce him to the Prime Minister later this week.

RA

ROBERT ARMSTRONG

19 January 1982



The first of the two main sections of the report, the new (and revised)
 section on the reception of industrial development in the country, is
 a welcome addition to the report. It is a good idea to have a
 separate section on this subject, and it is very happy to see
 that it has been included. The second section, on the other hand,
 is a bit of a disappointment. It is a bit of a disappointment
 because it is a bit of a disappointment.

COMMUNICATIONS

MR 12
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19 JAN 1982



*Guest
meal
Wm
y/ro*

PROFESSOR JOHN M ASHWORTH

DSc, FIBiol.

Vice-Chancellor
University of Salford
Salford M5 4WT
061-736 5843

34 Hawthorn Lane
Wilmslow
Cheshire
SK9 5DD



University of Salford

Salford M5 4WT

*From the
Vice-Chancellor*

Professor J M Ashworth
DSc, FIBiol

Telephone 061-736 5843

Telex 668680 (Sulib)

Dear Willie,

A note to tell you that I have now completed my move from the CPRS, Whitehall and the Civil Service and am now settled at the above addresses.

Yours sincerely,
John Ashworth.

FILE

you Mack

SIR ROBERT ARMSTRONG

Chief Scientist, CPRS

You had a further word with the Prime Minister this afternoon about the proposed appointment of Dr. Nicholson as Chief Scientist, CPRS.

The Prime Minister said that she was content for you to offer him the appointment on the terms agreed in discussion.

C A WHITMORE

24 September 1981

MM

289



10 DOWNING STREET

From the Principal Private Secretary

PERSONAL
SIR ROBERT ARMSTRONG

CHIEF SCIENTIST, CPRS

You minuted the Prime Minister on 21 September 1981 about your search for a successor to Dr. Ashworth as Chief Scientist CPRS, and she raised the subject briefly with you after E this afternoon.

My impression was that you had satisfied her in your short exchange with her this afternoon on the question of finding an offsetting saving elsewhere at Deputy Secretary level, but when I asked her to confirm this this evening before replying to your minute, she said that she was not convinced that the CPRS needed a Chief Scientist. Rather, she thought that there might be a better case for attaching Dr. Ashworth's successor to No. 10. I said that I saw considerable difficulties about doing this, both in terms of generating work of the kind which somebody of Dr. Nicholson's quality would expect and of staff numbers.

The Prime Minister then reverted to the misgivings about some of the CPRS's recent products which she had expressed earlier in the week apropos their paper on pay. She went on to make some further comments which I should like to report to you orally.

I suggested to her that the best way of proceeding on this subject was to raise it when she, you and I discussed the idea of a Prime Minister's Department during the visit to Melbourne, and she agreed with this.

G. A. WHITMORE

23 September 1981

Can't consider before

Prime Minister

Shelley reduction in
found
Ref. A05589

PRIME MINISTER

When you announced Sir Robert Armstrong
as Deputy Secretary level, you said that you hoped an
Armstrong's name at the same level could be found
elsewhere. Sir Robert Armstrong believes that this emergency
replacement will be found in the Chief Scientist, Home Office
Chief Scientist, CPRS post, but this will not be for a little
time. Sir Robert Cotton does not think he can displace Sir
Armstrong, the present Chief Scientist, while the case of Sir Cliff, the
scientist, still has to be brought to a conclusion. Ash

As you know, Dr John Ashworth has left the CPRS to become Vice
Chancellor of the University of Salford. With your agreement we have been
looking for possible replacements, this time at Deputy Secretary level.

2. Between us Mr Ibbs and I have canvassed a wide range of opinion about
possible successors, and two names came up more strongly than any others.
They were those of Professor Michael Ashby FRS (Professor of Engineering
Materials, University of Cambridge) and Dr Robin Nicholson FRS (Managing
Director of Inco Europe Limited and formerly Professor of Metallurgy,
University of Manchester).

3. It quickly became clear that Professor Ashby did not wish to be considered
for personal reasons. We have, therefore, been pursuing Dr Nicholson.

4. Dr Nicholson is 47. He is extremely highly regarded in the scientific
community (indeed, he was the President of the Royal Society's first choice when
we discussed possible candidates with him). And he has, from our point of view,
the great advantage of having had seven years in industry, and of having a strong
interest and experience of the application of science in industry.

5. Apart from these qualities he has an extremely lively mind and an
attractive personality.

6. Both Mr Ibbs and I think that we shall do well to get him, and that he
would make not just an effective but a distinguished contribution to CPRS and to
scientific advice at the centre of Government.

7. He would come to us on secondment for three years; and we are hoping
that we should be able to persuade him to come before the end of the year given
that Dr Ashworth has already left us. Certain technical problems - such as
pension arrangements - remain to be sorted out but subject to that I hope that we
should be in a position to make an announcement shortly after your return from
Melbourne, probably in the week beginning 12 October.

8. I attach a copy of Dr Nicholson's entry in Who's Who.

RA

ROBERT ARMSTRONG

21 September 1981

NICHOLSON, Robin Buchanan, PhD; FRS 1978; Managing Director, Inco Europe Ltd, since 1976; b 12 Aug. 1934; s of Carroll and Nancy Nicholson; m 1958, Elizabeth Mary, d of late Sir Sydney Caffyn; one s two d. Educ: Oundle Sch.; St Catharine's Coll., Cambridge. BA 1956, PhD 1959, MA 1960. University of Cambridge: Demonstrator in Metallurgy, 1960; Lectr in Metallurgy, 1964; Fellow of Christ's Coll., 1962-66;

Prof. of Metallurgy, Univ. of Manchester, 1966. Dir of Research Lab., Inco Europe Ltd, 1972; Dir, Inco Europe Ltd, 1975. Mem., SRC, 1978-. FIM, MInstP. Rosenhain Medallist, Inst. of Metals, 1971. *Publications*: Precipitation Hardening (with A. Kelly), 1962; (jtl) Electron Microscopy of Thin Crystals, 1965; (ed and contrib. with A. Kelly) Strengthening Methods in Crystals, 1971; numerous papers to learned jls. *Recreations*: family life, gardening, music. *Address*: Whittington House, 8 Fisherwick Road, Whittington, near Lichfield, Staffs WS14 9LH. T: Whittington 432081. *Club*: MCC.



Good Monday file AN
u. CPRS

10 DOWNING STREET

From the Principal Private Secretary

SIR ROBERT ARMSTRONG

CHIEF SCIENTIST, CPRS

The Prime Minister discussed with you and Mr Ibbs this afternoon your minute A04675 of 9 April 1981 about the provision of scientific advice at the centre of Government.

You said that Dr Ashworth would be leaving the CPRS in the summer. He needed to be replaced in order to provide a capacity at the centre which furnished advice to the Prime Minister, yourself and the CPRS on the whole range of civil scientific matters of interest to the Government. Dr Ashworth also represented the British Government on a number of international scientific bodies operating under the auspices of organisations such as the European Commission, OECD and UNESCO. To get the sort of scientist we needed - one who would not only provide first-rate advice but whose presence in the CPRS would also convince the country's scientific establishment that Government was taking the requirement for such advice seriously - Dr Ashworth's post would probably have to be upgraded to Deputy Secretary.

Mr Ibbs added that Dr Ashworth's most important single function was servicing ACARD. This took up about half of his time. More generally, Dr Ashworth was involved in many of the problems the CPRS was working on. It was important to have a senior scientist in the CPRS as part of the inter-disciplinary team: the CPRS would be the weaker without one.

The Prime Minister said that she was not yet convinced that Dr Ashworth needed to be replaced. There was already ample capacity in Government departments and the Research Councils to provide all the scientific advice the Government could require. The CPRS could draw on this. Alternatively, she would not object if the CPRS recruited a new Chief Scientist provided there was an off setting reduction of a scientific post in the same grade elsewhere in government.

You said that you would explore these possibilities and report further to the Prime Minister.

I am sending a copy of this minute to Mr Ibbs.

JAW.

7 May 1981

AN

PRIME MINISTER

You are seeing Sir Robert Armstrong and Mr. Ibbs at 1630 tomorrow, Thursday to discuss two staff matters affecting the CPRS:-

a) The replacement for Dr. Ashworth as the Chief Scientist, CPRS and Sir Robert Armstrong's proposal that we should strengthen the availability of scientific advice at the Centre by having an informal arrangement with a small number of very highly distinguished scientists who could be consulted ad hoc.

b) The proposal that an Under Secretary vacancy in the CPRS should be filled by Mr. Gordon Wasserman, a Home Office Assistant Secretary, on promotion.

The papers on both subjects are in the attached folder.

AW.

6 May 1981



10 DOWNING STREET

From the Principal Private Secretary

*You may
CW copy*

*Now being delayed.
[redacted] [redacted] is/w*

*Arranged for
Monday 27th
April at 11.30
Ed. 1514*

SIR ROBERT ARMSTRONG

CHIEF SCIENTIST, CPRS

The Prime Minister has seen your minute AO4675 of 9 April 1981 about ways of strengthening the provision of scientific advice at the centre of Government.

She has said that she would like to discuss this matter with you on her return from overseas, and we will be in touch with your office to arrange a time. You might like to know in advance, however, that the Prime Minister's preliminary view is that there is no need to upgrade the post of Chief Scientist, CPRS. She has commented:-

"The advice available through the ABRC should be available to me, and it is much more varied than that of any one scientific adviser".

KAW.

14 April 1981

PRIME MINISTER

No - the advice available
through the ABRC should be
credible to me and
it is much more
varied than that
of any
one
scientific adviser.
NB.

Scientific advice at the centre

The attached minute from Sir Robert Armstrong argues that we need to strengthen the arrangements for providing scientific advice at the centre of Government, i.e. to you, the Cabinet Office and the CPRS.

To this end Sir Robert Armstrong makes two proposals:-

(i) He recommends an informal arrangement which would allow us to call upon the advice of a small number of scientists who are outstanding in their fields - for example, Sir Sam Edwards and Sir Hans Kornberg. This seems to me a good idea, provided we really are going to make enough calls of the right kind on these people to justify recruiting them in this way.

(ii) Sir Robert Armstrong proposes that when Dr. Ashworth leaves the CPRS in September to become the Vice Chancellor of Salford University, his post should be regraded from Under Secretary to Deputy Secretary. It is for this suggestion that your immediate approval is sought. Plainly, whether you give your agreement depends on whether you are convinced that there are insufficiencies in the scientific advice which is at present available at the centre of Government.

Would you like to discuss Sir Robert Armstrong's proposals with him before you offer a view on them? If you do, I think that this will mean waiting until your return from overseas.

JAW.

10 April 1981



SENIOR STAFF IN CONFIDENCE

PRIME MINISTER

Chief Scientist, CPRS

The appointment of Dr. Ashworth, the present Chief Scientist, CPRS, to be Vice-Chancellor of Salford University with effect from September 1981 makes it necessary to take early steps to find a successor.

History

2. As you will remember, Lord Zuckerman and Sir Alan Cottrell, as Chief Scientific Advisers to the Government, reported direct to the Prime Minister and the Secretary of the Cabinet; they worked alongside and to some extent with the Head of the CPRS, but did not report to him. When Sir Alan Cottrell retired, he was not replaced as Chief Scientific Adviser; Dr. Press carried out the functions (but without the title) from 1974 until he retired from full-time employment in 1976, and Dr. Ashworth was appointed in 1976 as Chief Scientist, CPRS, with the rank of Under Secretary.

3. As civil science has been organised in Government since the Rothschild Report in 1971 (Cmnd. 4814) and the ensuing White Paper (Cmnd. 5046), there has not been the same need for a Chief Scientific Adviser to the Government as there was before. Responsibility for civil science has been placed with the Secretary of State for Education and Science, whose decisions about the distribution of funds are made on the advice of the Advisory Board for the Research Council's (ABRC). The ABRC's main function has been to advise on the distribution of funds to the Research Councils, but it has also been to some extent (though not a sufficient extent completely to satisfy the scientists) a source of advice on broader questions of scientific policy and a link between the Secretary of State and scientists in the universities.

4. The Advisory Council for Applied Research and Development (ACARD) was set up in 1976 as an advisory body on questions of applied research and technology. It has, as you know, produced some useful reports, and has been effective in defining national needs in the development of technology.

SENIOR STAFF IN CONFIDENCE

The role of the Chief Scientist, CPRS

5. The Chief Scientist, CPRS, is very much at the centre of scientific activity in Government, as a member or assessor both on ABRC and on ACARD, and as a member of the Committee of Chief Scientists and Permanent Secretaries (STO). In so far as you, I and Mr. Ibbs need and look for advice on civil scientific matters at the centre of Government, he is the source of it. He also has to act as Her Majesty's Government's representative in international scientific relations of various kinds (in some of which his partners from other countries are Ministers).

6. Dr. Ashworth has done the job admirably, with energy and drive as well as good sense. It is no reflection on him when I say that I think that we are not quite strong enough on the co-ordination of scientific policy and the provision of scientific advice at the centre; indeed, it is partly his particular personal qualities that have masked what is, I believe, a deficiency in organisational terms.

7. I do not want to go back to having a Chief Scientific Adviser to the Government: I do not think that the present organisation of civil science requires that. Scientific and Technological considerations now enter into a very wide range of decisions, and are nowadays brought to bear on decision-making down the line in Departments; and I am not sure that we can any longer hope to find, or would want to have, a "political" scientist like Lord Cherwell or Lord Zuckerman. But I believe that the centre, and particularly the Prime Minister, should have the means of access to scientific advice over the whole range when necessary; and I believe that there ought to be at the centre of Government a stronger bridge between "pure" and "applied" science than we have at present.

8. I have been discussing this with Mr. Ibbs over recent months and he shares these general views. Our minds have now been concentrated by the prospect of Dr. Ashworth's departure. As a result I have two proposals to make.



SENIOR STAFF IN CONFIDENCE

9. First, I should like to propose that we should have an informal arrangement with a small number of scientists of the highest eminence in their fields - people of the quality of Sir Sam Edwards and Professor Kornberg - whereby they would be available individually to be called upon by you, me, Mr. Ibbs or the Chief Scientist, CPRS, for consultation or advice. I envisage that they might on occasion be asked for advice on specific questions or issues; but that they should also be free to volunteer advice, if they wanted to do so. Such an arrangement would give the centre access to scientific advice over a wide range of disciplines, without going to the formality of setting up a Council of Scientific Advisers.

10. Secondly, I think that we should strengthen the scientific capacity in the Cabinet Office. In my view we should keep it in the CPRS; but we should upgrade the post of Chief Scientist to Deputy Secretary, and we should look for someone who by virtue of his qualifications and experience will be regarded with respect as an interlocuteur valable by the "pure" scientists and the technologists. The sort of man I have in mind might be a Professor of Engineering who was a Fellow of the Royal Society, but that is purely illustrative: that he should be the right sort of man is more important than the exact qualifications. I attach a job description, to give you some indication of what he would be expected to take on.

11. As you know, the House of Lords Select Committee on Science and Government has recently turned its attention to the provision and co-ordination of scientific advice to Government. The main impetus for this has come from Lord Todd, the recently retired President of the Royal Society, who I understand would like to go back to the good old days of a Minister for Science and a Council of Scientific Advisers. The Royal Society has recently put in evidence to the Select Committee, of which I attach a copy. The three salient points are:

- (i) the grading of Chief Scientist posts in Departments has been eroded and diminished and ought to be restored [this shaft is aimed at the Ministry of Agriculture];

SENIOR STAFF IN CONFIDENCE

- (ii) the present arrangements for interdepartmental co-ordination of scientific advice to Government are much less satisfactory than those of a decade or more ago;
- (iii) the post of Chief Scientist in the CPRS should be retained and enhanced in status after Dr. Ashworth's departure.

12. The immediate purpose of this minute is to seek your approval to the upgrading of the post of Chief Scientist, CPRS, from Under Secretary to Deputy Secretary when Dr. Ashworth goes. Mr. Ibbs unreservedly supports this recommendation. I have consulted Sir Ian Bancroft, who has reminded me that you have said that you will not approve proposals for upgrading posts at this level unless they are both urgent and established up to the hilt, but has said that he would have no objections to the proposed upgrading. I hope that you will feel that I have established the case; the departure of Dr. Ashworth makes it urgent. And of course this would not represent any increase in staff numbers in the Cabinet Office: merely the substitution of an Under Secretary by a Deputy Secretary.

13. If you are content, I shall immediately set about drawing up a short list of candidates, in consultation with Sir Ian Bancroft, Sir Peter Carey, Sir James Hamilton, Mr. Ibbs, certain Chief Scientists in Government, Sir Hermann Bondi and one or two other former Chief Scientists. I should also like to consult the President of the Royal Society, Sir Andrew Huxley, who has told me that he would be very willing to assist in the search. I will consult you again when the short list is drawn up, before making any approach.

14. I am sending a copy of this minute to Sir Ian Bancroft.



Robert Armstrong

9th April 1981



REPUBLIC OF INDIA

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-9 APR 1981

JOB DESCRIPTION: CHIEF SCIENTIST, CPRS

The Chief Scientist provides scientific advice for the CPRS and the Cabinet Office generally. He sits on the principal Government Committees which deal with scientific and technical issues other than secret defence/nuclear matters. He is the Government's scientific representative on many international occasions.

Cabinet Office

The Secretary of the Cabinet as appropriate looks to the Chief Scientist, CPRS to provide, or organise the provision of, advice on scientific matters or scientific aspects of other issues which come to the Cabinet Office, for example, from the Prime Minister's office or from Summit meetings (e.g. the UK response to the US Global 2000 Study to be discussed at Ottawa).

The Secretary of the Cabinet will also look to him when necessary for advice on the overall co-ordination of the Government's scientific interests and effort. It follows that the Chief Scientist, with his opposite numbers in Departments, takes an interest in the general problems of the Scientific Civil Service. (Dr Ashworth was a member of the Working Party which wrote Cmnd 8032.)

CPRS

The Chief Scientist is responsible for providing scientific/technological input to CPRS studies. However, he is not constrained by title and has the opportunity to contribute to issues not overtly scientific/technological so that wide-ranging advantage is obtained by having the Cabinet Office Chief Scientist in the CPRS.

Government Committees

The Chief Scientist is ex officio a member/assessor of -

- (i) Advisory Council for Applied Research and Development (ACARD) - serviced by the Cabinet Office;
- (ii) Advisory Board for the Research Councils (ABRC) on which he is regarded as an "independent" - serviced by DES;

(iii) Member of the Committee of Chief Scientists and Permanent Secretaries (STO) - serviced by the Cabinet Office.

These three bodies between them take all the major scientific/technological issues that come before the Government except the secret defence/nuclear ones or those which are solely the concern of a single Department. The Chief Scientist CPRS is the prime link between ACARD and Government and plays a central role in planning ACARD's work. He has been closely involved with all the ACARD reports so far published (eight in total).

International Affairs

The Chief Scientist has a general oversight remit that covers -

- (a) the UK's bilateral scientific and technological agreements with other countries. These are usually part of more general economic co-operation agreements and are serviced by the International Technology Group, Department of Trade. In this connection the Chief Scientist is co-Chairman of the Anglo-Soviet Joint Commission (meets alternately in Moscow and London for one week) and has taken a special interest in Anglo-Chinese relationships.
- (b) The EC R & D Budget. The Chief Scientist is UK titulaire on CREST (the Committee that advises both the Council of Ministers and the Commission) and briefed by EST (an interdepartmental Whitehall Committee) serviced by the Department of Industry.
- (c) Other. The Chief Scientist is often asked to attend (or accompany Ministers attending) general fora on scientific/technological topics organised by bodies such as the OECD, UNESCO, UNCTAD, etc.

THE ROYAL SOCIETY

THE PROVISION AND COORDINATION OF SCIENTIFIC ADVICE TO GOVERNMENT

Evidence submitted by the Council of the Royal Society to the House of Lords
Select Committee on Science and Technology, March 1981

CONTENTS

1. Introduction.
2. The flow of scientific advice to policy-making levels in Government.
3. Policy for science.
4. Present arrangements for the coordination of scientific advice.
5. Suggestions for strengthening scientific advice on Government's overall strategy.
6. The role of The Royal Society.
7. Summary.

1. INTRODUCTION

- 1.1 Science, including all branches of natural science and mathematics and their practical application, affects almost every aspect of life and the interests of all departments of Government. It is an engine of technological change and, hence, potentially of economic and social betterment through industry, medicine, agriculture and protection of the environment. There is, therefore, a need both for a national policy for the support of fundamental science (and education in science) and for a means by which science and technology can be taken properly into account in all policy formulation. It is in this sense that 'scientific advice to Government' is here understood.
- 1.2 The advice which Government should seek from scientists and about science can be put into three categories. First, advice on the support of science itself - the accumulation of knowledge, the maintenance of a research capability and the provision of education and training facilities adequate to ensure a supply of trained scientific manpower and a scientifically literate population. Second, there is the advice needed to ensure that any given policy of Government is as soundly based in science and technology as in its social, political, economic or other premises, and that inherently unscientific and hence unworkable policies are modified or replaced. Third, there is the need to look ahead and advise on the implications for Government strategy and policies of all kinds, of likely developments in science and its application.
- 1.3 To be effective, advisers need: (a) a substantial intelligence network and a close relationship with the science and technology community as a whole, both national and international, and (b) a sound judgement and equally close relationship with those concerned in assessing socio-political and economic interactions and in implementing policies. Only in this way can the complexity of problems be adequately tackled and new discoveries find appropriate technological routes to innovation and wealth creation.

1.4 Some examples of the civil fields in which such advice has proved critical are: energy systems (including nuclear power policy); new forms of rail or air transport; space policy; environmental protection policy; industrial strategy, short and long-term (e.g. biotechnology, information technology, robotics, innovation, computer aided design); climatology; resource policy; medical care; implications for agricultural policy of genetic engineering; fisheries policy; the basis of a sound pesticides policy; new technology in fire prevention; the formulation and implementation of policies for such essential services as water; the validity of health and safety procurement options and a host of others. Many of these extend across the whole range of Departmental objectives and impinge on, or may sometimes be central to, the effective implementation of a Government's overall strategy.

1.5 Technological change will occur; employment and wealth will be created, but not necessarily in the U.K. Adequate advice based on information from overseas and its receipt, not least by those defining foreign policy, are essential if the implications of technological change for trade are to be taken fully into account. Our diplomats and negotiators need to be at least as well informed in this way as those of other major countries.

1.6 In the British system of Government in which each Minister is responsible to Parliament for the expenditure in his Department it is difficult, but essential, to ensure both that adequate scientific advice is available to each Departmental Minister and that efficient mechanisms exist for dealing with the many scientific issues that cut across Departmental interests and responsibilities.

1.7 Although Government is a major employer of scientists, more than half of our scientific (in the broad sense) research and development is undertaken outside Government departments - in Research Councils, universities, industry, grant-aided institutions, etc. The arrangements for scientific advice to Government in this country must therefore provide adequate channels to receive advice from such quarters.

1.8 As an independent national academy of science, with a broadly-based concern for all aspects of fundamental and applied science, the Royal Society is a unique source of such advice. It is well placed to assist in monitoring, from a scientific viewpoint, the implementation of policies and to provide on its own initiative, or at the request of Government, periodic reports on specific issues. (See also section 6 of this evidence.)

2. THE FLOW OF SCIENTIFIC ADVICE TO POLICY-MAKING LEVELS IN GOVERNMENT

2.1 There are some serious obstacles to the flow of appropriate advice from the best scientific sources to the policy-making levels in Government. Some of these are inherent, for good or ill, in our national traditions; especially important here are the facts (a) that more than half the scientific research in the U.K. is done outside Government departments, (b) that most members of the administrative civil service have no training in and modest understanding of science, and (c) that most scientists have little appreciation of public administration and the machinery of Government.

- 2.2 Science is only one element in defining and executing policy, but too often its role is far too narrowly delimited or even unrecognized by senior administrators and economists. This is especially true in longer-term issues where new technological developments can radically alter the operation of other factors. Assessment of future trends is notoriously difficult but the scientist's capacity to allow for discontinuities instead of simple extrapolations can be vital. It is essential, therefore, that high level scientific advisers should work as administrators and have access to policy papers so that they can assist in defining questions, not just in providing answers.
- 2.3 It was partly to meet these needs that both Lord Rothschild in 1971 and the White Paper on Framework for Government Research and Development (Cmnd 5046) in 1972 emphasized the need for Departments to have strong Chief Scientists. Although it is recognized that the duties of Chief Scientists have in some cases been difficult to define, the Council of the Royal Society views with very grave concern the erosion and down-grading of these posts which is now apparent in some Departments.
- 2.4 The importance of having Chief Scientists at a high level (at least Deputy Secretary) is stressed, since to be properly effective they must work with other administrators at the policy-making level, and not just be on call. Their role is as much concerned with their contribution in terms of judgments made against the background of their special expertise as in the provision of scientific advice per se.
- 2.5 Since no adviser can be an expert in more than a very small part of the broad areas upon which advice may be required, he must be adequately supported by his own technical staff. Here it would be beneficial to see greater use made of high quality people on relatively short-term secondment from outside Government, for instance from industry, the universities and the Research Councils. Moreover, for the reasons implicit above, these support groups will be most effective if they include individuals with experience in both science and administration.
- 2.6 The Chief Scientist also needs to be able to draw on scientific advice from outside Government; he needs to know where to go for this advice and to have easy channels of communications. The Requirements Boards of the Department of Industry have assisted in this process but the abolition of some 'quangos' (for instance, the National Electronics Research Council and the Aeronautical Research Council) has impaired Government's ability to draw on outside advice. It is a matter for concern that no mechanisms seem to have been developed to replace the advice given by these valuable bodies. Chief Scientists should, in addition, feel free to call upon the Royal Society, the Fellowship of Engineering and other independent bodies for advice.
- 2.7 Lord Rothschild (1971) distinguished clearly between the Chief Scientist and the Controller R & D, and this distinction has been reiterated in a recent review of the Scientific Civil Service (Cmnd 8032, 1980). Certainly the provision of high-level scientific advice and judgement within a Department is a different function from controlling in-house and commissioned R & D, but there must be many interactions between the two functions. If the two posts are combined there is an inevitable but not necessarily insoluble dilemma; involvement in day to day consensus management of the Department is essential, but there is also a need to maintain

longer term perspectives and where necessary to upset traditional policies and conventional wisdom.

- 2.8 In large Departments such as Defence and Industry the Chief Scientist with at least the rank of Deputy Secretary should be separate from the Controller R & D who is responsible for the management of the research establishments. (This is currently the practice in the Ministry of Defence.) The Chief Scientist should be responsible for forward thinking, for planning the overall research strategy of the Department, for authorizing research commissions and for helping to formulate policy on matters with a significant scientific content. He or she should not be concerned with the problems of day to day management of the establishments.
- 2.9 Whether the two posts are combined or not, departmental laboratories should report directly to a very senior official widely recognized for his own scientific achievements. Regrettably there has been in recent years a noticeable fall in the scientific status of government laboratories, and part of the reason for this has been the understandable unwillingness of distinguished scientists to head laboratories that report primarily to administrators.
- 2.10 By all these means the voice of the scientist, which by its nature may from time to time strike a discordant note, must be heard amongst those formulating policy and closely advising Ministers particularly in longer-term perspectives. Government cannot afford to be caught technologically unaware by other countries if any overall strategy is to be maintained, even for the life of a single Administration.

3. POLICY FOR SCIENCE

- 3.1 Responsibility for Civil Science rests with the Secretary of State for Education and Science and decisions about how the available funds are to be spent are made on the advice of the Advisory Board for the Research Councils (ABRC).
- 3.2 It is proper that fundamental research priorities should be in the hands of the scientific community but it is essential that fundamental research, its implications, and its practitioners are not isolated from the process of advising Government. In some fields today's scientific discovery will rapidly become tomorrow's new products. Fundamental and applied research feed on each other and comprehensive advice will normally be derived from both. Moreover, in some areas no firm policy can be defined until fundamental research has been undertaken and knowledge advanced.
- 3.3 This implies first, that active channels of communication are needed between those in fundamental research and those formulating Government policies of all kinds; and second, that a substantial independent forum should exist for discussion of scientific issues of all kinds, their significance and their implications.
- 3.4 The terms of reference of the ABRC are:
- (a) To advise the Secretary of State on his responsibilities for Civil Science with particular reference to the Research Council system, its

- 5 -

articulation with the universities and departments, the support of postgraduate students and the proper balance between international and national scientific activity;

(b) To advise the Secretary of State on the allocation of the Science Budget amongst the Research Councils and other bodies, taking into account funds paid to them by customer departments and the purposes to which such funds are devoted;

(c) To promote close liaison between Councils and the users of their research.

Regrettably, however, The Board has been so occupied with (b) that it has not been able to pay sufficient attention to the provision of advice to the Secretary of State on the broader aspects of his responsibilities for Civil Science.

3.5 The ABRC could usefully be strengthened by a small increase in its independent membership and more especially by giving the Chairman a fuller role. The Chairman, who would need to give at least two days a week to the job, could contribute substantially in discharging the unique responsibility of the Department of Education and Science (DES) for basic science, particularly at interdepartmental and international meetings. Similarly, the DES should make greater use of the scientific expertise that is available in the Research Councils, the Royal Society, the universities and other bodies that receive a substantial proportion of their funds from the Department.

3.6 In principle the DES and the ABRC together provide a mechanism by which Government could draw on the whole field of basic science and ensure that Departmental needs are being adequately supported by strategic research. The present rigid distinction in Government thinking (but not in the real world) between basic and applied science is inherently dangerous and particularly so if it leads to a view that advice can be similarly pigeon-holed.

4. PRESENT ARRANGEMENTS FOR THE COORDINATION OF SCIENTIFIC ADVICE

4.1 With responsibilities for science and technology so widely distributed among departments of state, there is clearly a need for coordinating mechanisms. The matter is far too important and far too complex to be left simply to ad hoc interdepartmental consultation as and when problems arise, and to the Cabinet or Parliament or both if the problems become of sufficient political importance. This need was well recognized by Lord Rothschild (Cmnd 4814, paragraphs 56-60) who argued that the task of the Chief Scientific Adviser was a major and continuing one whose successful prosecution will greatly improve the efficiency of Government R & D. This was accepted in the White Paper (Cmnd 5046) which stated that 'The Chief Scientific Adviser to the Government has responsibility for inter-departmental coordination. He advises Ministers on the scientific and technological aspects of the Government's policies, both domestic and international.'

4.2 That was in 1972, but by 1974 the post of Chief Scientific Adviser became vacant and two years later was abolished. In retrospect one can see that, in the absence of strong support by the Prime Minister, and with the parallel growth of the Central Policy Review Staff (CPRS) (headed from 1971 to

1974 by Lord Rothschild, himself a distinguished scientist), this was inevitable. Nevertheless the arrangements for interdepartmental coordination and across-the-board advice to Ministers that have since emerged fall far short of those adumbrated by Lord Rothschild in Cmnd 4814.

- 4.3 In 1976 Government set up a new body, the Advisory Council for Applied Research and Development (ACARD) consisting largely of independent scientists and technologists from industry and the universities with the Lord Privy Seal as titular Chairman and a Fellow of the Royal Society as operative deputy chairman. In 1979 Ministerial responsibility for it was transferred to the Prime Minister herself and the chairmanship devolved on a distinguished scientist and industrialist. ACARD has been effective in defining national needs, but its role is entirely advisory - it has no responsibilities for interdepartmental coordination - and it has no funds of its own. Nor is it clear that Government takes much notice of its advice.
- 4.4 Mention has already been made of the ABRC whose activities, in spite of the potential of its membership, have been limited almost entirely to advice on the allocation of the science budget. The Department of Education and Science itself has had no remit to provide for inter-departmental coordination as it is limited by the binary classification of basic and applied research to the former. Nevertheless, due to the very nature of science, the Department has on occasion found itself having to attempt some measure of coordination in some matters (e.g. genetic manipulation, biotechnology) which cut across rigid classifications of research.
- 4.5 The Chief Scientist in the CPRS perhaps provides the nearest present day equivalent to the Chief Scientific Adviser so clearly advocated by Lord Rothschild. He is centrally placed, has access to Cabinet Office papers and can draw on scientific knowledge from a wide range of sources. Nevertheless at Under Secretary level he is junior to the Chief Scientists in the main Departments and has no mandate to secure coordination between them.
- 4.6 For many years the House of Commons Select Committee on Science and Technology provided a useful forum. It was able to draw public attention to gaps between departments in their support of science and technology, and to longer term issues that might be expected to affect Government policy and national interests as a whole. The abolition of this Committee in 1979 has been regretted by many, including the Prime Minister, and it is already evident that the new departmental Select Committees will find it difficult to provide the broad examination of scientific and technological issues that affect the policies of several departments.
- 4.7 The creation of the House of Lords Select Committee on Science and Technology in 1980 is warmly welcomed. Its first reports have been in areas that lie between departments. However, like its predecessor in the Commons, although its reports require a response by Government, its influence is inevitably less direct than that of the new departmental Select Committees.

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The unavoidable conclusion of this section of the Society's evidence is that present arrangements for interdepartmental coordination of scientific advice to Government are much less satisfactory than those which were in operation in 1971.

5. SUGGESTIONS FOR STRENGTHENING SCIENTIFIC ADVICE ON GOVERNMENT'S OVERALL STRATEGY

- 5.1 The need for some improvement in present arrangements seems particularly evident in relation to matters which affect several Departments and are considered at Cabinet level. At this level there appears to be a need for broadly based scientific advice and judgement which are not closely linked to the interests of any one Department.
- 5.2 There are several options for strengthening the arrangements for advice on matters that affect Government strategy as a whole. Among these may be mentioned: a Minister for Science, a Ministry of R & D, a Chief Scientific Adviser (separate from CPRS), a new body like the old Advisory Council of Scientific Policy, and extended powers for ABRC or ACARD or both.
- 5.3 In present circumstances which do not warrant major changes in the organization of science in Britain, it would seem that significant improvements in arrangements for the provision of advice on Government's overall strategy could better be made in other ways.
- 5.4 The Prime Minister herself has assumed responsibility for coordination of scientific research and development in Government, and in many ways this is preferable to leaving the responsibility with a departmental Minister. Coordination can only be effective if the Prime Minister wishes it to be but inevitably there are many other urgent demands on her attention, so that science (in the broad sense) will seldom get the attention that its long term needs and benefits demand. It would therefore seem necessary for the Prime Minister to have ready access to centrally located high level scientific advice.
- 5.5 The most appropriate location for such advice would seem to be in the Central Policy Review Staff (CPRS), which has a number of valuable features, especially its central position with direct access to the Prime Minister and the Cabinet Office, its concern with Government's strategy as a whole and all aspects of policy, its remit for consideration of longer term issues and its capacity to bring in able young staff on secondment.
- 5.6 Science in the broad sense is one of the major factors that must be taken into account in the CPRS, for it is a pervasive and increasingly influential element - an engine for change. It is therefore important that the CPRS should include a Chief Scientist or a Chief Scientific Adviser with the rank of at least Deputy Secretary. He would have two main functions: to coordinate scientific policy and initiate studies on projects and programmes that involve several departments (e.g. the space programme); and provide independent advice to Cabinet on major and especially controversial issues with important scientific content. These functions include an important role in coordinating British policy on scientific matters in a wide range of international organizations and in bilateral relations.

- 5.7 In order to fulfil these tasks, he will need to have a small technically qualified staff and also to draw freely on expertise and advice from other Government departments, Research Councils, ACARD and non-government bodies (e.g. the universities). The Royal Society is willing to provide a powerful link and channel of communication with the latter.
- 5.8 To be effective, the Chief Scientific Adviser must command widespread confidence and respect within the scientific community as a whole, so he should be a F.R.S., and the President of the Royal Society should be consulted on his appointment.
6. THE ROLE OF THE ROYAL SOCIETY
- 6.1 Throughout its long history the Society has been a forum for the public or private discussion of scientific and technological issues of national concern. The Society, acting corporately through its Council, has also undertaken studies of and produced reports on such matters. This activity has increased recently, some 18 studies having been undertaken in the past two years.
- 6.2 On some occasions these studies have been made in response to specific requests, for instance, when Select Committees of the House of Lords have invited the Society to give evidence, or when the Chief Scientist of the Department of Energy in 1976-7 asked the Society to comment on two draft documents on energy R & D. On other occasions the initiative has come from within the Society and its many committees.
- 6.3 Such studies are entrusted to specially selected and usually broadly based groups with memberships seldom restricted to Fellows. Advice and assistance of other expert individuals or organizations, such as the Fellowship of Engineering, are generally sought. The active involvement of Chief Scientists and others from Government Departments in these studies has been particularly valuable.
- 6.4 The duration of these groups varies; some may continue for 2-3 years, but more often reports, for example in response to official enquiries, are produced in a matter of months or less. The reports are considered and often amended by Council on whose authority they are published, sometimes in association with a public discussion meeting.
- 6.5 In this manner, the Society can provide an independent, constructively critical voice for science as a whole. In proffering advice to Government, Council is aware of the elements other than science (e.g. economic and social aspects) which are relevant to the problem and its solution, and recognizes that the Society's special competence is in the purely scientific - but not of course just pure science - aspects.
- 6.6 The Society has recently carried out one study - on biotechnology - jointly with two advisory bodies to Government and, given the right to comment independently thereafter, would be willing to consider further joint undertakings of that kind with public or private bodies.

The value of the Society's advice has been long recognized by successive Governments. This is also reflected in the statutory requirements for the Secretary of State for Education and Science to consult the President about certain scientific appointments, and the right of the Society to nominate assessors to the five Research Councils and to nominate some members of certain other public bodies. Informal consultation also occurs and the Officers of the Society would welcome an increased dialogue with Departments and with the CPRS, not only about possible candidates for senior scientific posts but also on the much broader basis of providing a ready channel to specific scientific expertise. It should be remembered that the Society's knowledge of the scientific community extends far beyond its Fellowship.

6.8 The breadth of the Society's coverage is not limited to the U.K. Its Fellowship extends across the Commonwealth and through its adherence to the international scientific unions and associations and its bilateral contacts with academies it can provide valuable information about developments in science and technology all over the world.

6.9 The Society also has a special competence in science education. Its Education Committee is supported by a series of subject committees run jointly with the appropriate professional institutions, including the Institute of Biology, the Royal Society of Chemistry, the Institute of Physics, the Institute of Mathematics and Its Applications, the Council of Engineering Institutions and the Institution of Geologists. The Society is deeply concerned to see improvements in the teaching of science and mathematics in schools at all levels. Naturally the Society has a special concern for the education of those who will go on to universities or polytechnics to study science and science-based subjects, but it is also concerned that those who study other subjects, and those whose full-time education ceases at 16-18, shall have a thorough grounding in science. The widespread failure of our education system to inculcate a proper understanding of science, mathematics and technology is a serious national problem. This deficiency is evident in both government and industry at all levels.

7. SUMMARY

7.1 Science, including all branches of natural science and mathematics and their applications, affects almost every aspect of life and the interests of all departments of Government.

7.2 The scientific advice that Government should seek may be put into three categories: advice on support for science itself, advice to ensure that any given policy of Government is soundly based in its scientific and technological aspects; advice on longer term implications of likely developments.

7.3 The implications of technological change must be taken fully into account in foreign policy and trade. Our diplomats and negotiators need to be at least as well informed in these matters as those of other major countries.

- 7.4 Arrangements for scientific advice to Government must take into account the fact that more than half of British scientific research and development is undertaken outside Departments.
- 7.5 There are serious obstacles to the flow of appropriate advice from the best scientific sources to the policy-making levels in Government. It is essential that high level scientific advisers should work as administrators and have access to policy papers so that they can assist in defining questions, not just in providing answers.
- 7.6 It was partly to meet these needs that Chief Scientists were appointed in some Departments. Council of the Royal Society views with very grave concern the erosion and down-grading of these posts which is now apparent.
- 7.7 The importance of having Chief Scientists at a high level (at least Deputy Secretary) is stressed. To be effective they must be adequately supported by technical staff and be able to draw on scientific advice from outside Government. The abolition of some 'quangos' has impaired Government's ability to draw on outside advice. New mechanisms are needed to replace the advice and valuable interactions with the scientific community outside Government which the 'quangos' provided. Chief Scientists should also feel free to call upon the Royal Society and other independent bodies for advice.
- 7.8 Responsibility for Civil Science rests with the Secretary of State for Education and Science. The terms of reference of the Advisory Board for Research Councils include advice to the Secretary of State in the exercise of these responsibilities. Regrettably, however, the Board has been so occupied with the allocation of the Science Budget amongst the Research Councils that it has not paid sufficient attention to the provision of advice on the broader aspects of Civil Science. The Board should be strengthened by increasing its small independent membership and more especially by giving the Chairman a fuller role.
- 7.9 The present rigid distinction in Government thinking (but not in the real world) between basic and applied science is inherently dangerous and particularly so if it leads to a view that advice can be similarly pigeon-holed.
- 7.10 In the sectoral system of British Government it is difficult, but essential, to ensure both that adequate scientific advice is available to each Departmental Minister and that efficient mechanisms exist for dealing with the many scientific issues that cut across departmental interests and responsibilities. The unavoidable conclusion of this review is that current arrangements for interdepartmental coordination of scientific advice to Government are much less satisfactory than those of a decade or more ago.

Noting that the Prime Minister herself has assumed responsibility for coordination of scientific research and development in Government, it would seem desirable to strengthen the Central Policy Review Staff by the appointment within it of a Chief Scientific Adviser with the rank of at least Deputy Secretary. His main function would include coordination of scientific policy, initiation of studies or projects and programmes that involve several Departments, and independent scientific advice to Cabinet on major issues with important scientific contents.

- 7.12 The Royal Society has, in recent years, increased its activity in producing broadly based reports on scientific issues of public concern. Council is ready to continue, and as appropriate to extend, this activity and would welcome an increased dialogue with Departments and the CPRS.

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