PREM 19/1339

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A Select Committee on Science and Technology in the House of Lords. ~~was proposed~~.
Enquiry into Science and Government

PARLIAMENT

NOVEMBER 1979

PREM 19/1339

Referred to	Date	Referred to	Date	Referred to	Date	Referred to	Date
~~14.11.79~~		~~3.6.82~~					
~~16.11.79~~		~~11.6.82~~					
~~19.11.79~~		~~21.6.82~~					
~~Nov 79~~		~~24.6.82~~					
~~28.11.79~~		~~2.7.82~~					
~~15.1.80.~~		~~July '83~~					
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~~6.2.81~~		12.9.85					
~~13.10.81.~~		~~14.9.84~~					
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~~11.1.82~~		3.9.84					
10.3.82		~~10.9.84~~					
~~24.5.82~~		24.9.84					
~~24.5.82~~		16.10.84					

Published Papers

The following published paper(s) enclosed on this file have been removed and destroyed. Copies may be found elsewhere in The National Archives.

House of Lords: Session 1981 -1982, 1st Report, Dated 12 November 1981: Select Committee on Science and Technology, Science and Government, ISBN 0 10 189570 4

House of Lords HANSARD, 10 February 1984, column 1389 to 1394: Research and Development: ACARD/ABRC Report

House of Commons HANSARD, 2 July 1982, column 399 to 400: Science and Government (Select-Committee Report)

Signed _____ Date 01/10/2013

PREM Records Team

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PS/

Secretary of State for Trade and Industry

16 October 1984

David Barclay Esq
Private Secretary to the
Prime Minister
10 Downing Street
LONDON
SW1

Dear David,

DRAFT GOVERNMENT RESPONSE TO THE HOUSE OF LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY : SUPPLEMENTARY REPORT ON ENGINEERING R&D

Thank you for your letter of 10 September with the Prime Minister's comments on the draft response.

2 The response has been amended and now states that the Government fully endorses the need for positive steps to enhance the level of civil spin-off and states how MOD are intending to do this.

3 If I may confirm two other changes which have been made they are:

(a) in paragraph 6 in response to an amendment received from the Treasury - you will have seen the correspondence between John Gieve and myself;

(b) in paragraph 15 - the UGC response has now been published, so the paragraph has been amended to reflect this.

... 4 I now enclose a copy of the final response sent to Lord Gregson.

Yours ever,
Andrew Lansley

ANDREW D LANSLEY
Private Secretary

Encl

JH1BAB

DEPARTMENT OF TRADE AND INDUSTRY
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From the Minister of State
for Industry and Information Technology

16 October 1984

Lord Gregson
House of Lords
London SW1

Dear John

GOVERNMENT RESPONSE TO THE SUPPLEMENTARY REPORT ON ENGINEERING R&D

Your Select Committee wrote to Kenneth Baker with a Supplementary Report commenting on the Government response to your Report on Engineering R&D. Norman Tebbit would have wished to reply personally but I am now writing on his behalf.

2 Your Committee expresses some concern about whether the Government shares your view of the importance of manufacturing industry, and engineering, in the UK economy. We have no doubts on this matter. As Kenneth Baker said in oral evidence to you on 14 March 1984 we believe that manufacturing industry, and the engineering sector, will continue to make a major contribution to wealth creation in the UK. A sufficient R&D base is a vital part of that contribution.

3 A number of specific points were made in your supplementary report and I will deal with each of these in turn.

Selectivity and Strategy

4 The Committee favoured a national strategy for technology formed in partnership between the Government, the public purchasing agencies and manufacturing industries. The Committee is aware of, and has commended, what we have done in microelectronics, in space technology, aeronautics, biotechnology and the Alvey Programme. The Government considers it essential to consult industry widely over these and other policies. We do so through our Requirements Boards, ACARD, NEDC, a variety of specialised committees and the many contacts that Ministers and officials have with industry on a day to day basis. Where Government policies have a particular impact on the product strategy and market opportunities for companies our consultations are close, as they have been in the information technology field and over the liberalisation of telecommunications.

5 As one input to our forward thinking a group of senior officials from this and other Departments considers longer term

issues. The purpose of such studies is to identify trends which will, over the next 10 to 20 years, be key influences on the manufacturing and commercial sectors of the economy. The group maintains close contact with strategic planning groups in industry, the universities and business schools as well as with the Research Councils, professional institutions and international bodies. We will continue to contribute towards the development of the next generation of key technologies, subject to the essential constraints on public expenditure, particularly through opportunities identified by the group, by ACARD, the Research Councils, and your Select Committee.

6 As for public purchasing, the Government's view is that it has an important role to play in fostering competitiveness and innovation in British industry. The policy launched four years ago ensures that public purchasers take account of wider market opportunities for their suppliers in their purchasing operations, subject to the requirement that this should provide the purchaser with improved value for money over the longer term. The Government has promoted consultation between public purchasers and the relevant supplying industries about future needs. It has encouraged and assisted public bodies to pull through new products in emerging areas of technology and it has provided finance for development. There are continuing opportunities here but examples of what has been achieved so far include the "Office of the Future" programme (mentioned in the response to your first report) electric vehicles, fibre-optics, medical electronic equipment, and the military communications satellite Skynet IV, from a joint venture between GEC-Marconi and British Aerospace.

7 The purchasing bodies must, of course, be responsible for their own decisions because to detract from that would weaken financial discipline and divorce decisions from market forces. But it would be wrong to think that the individual agencies have been left to develop their product strategies without considerations of industrial objectives and the effects of their purchasing on the UK suppliers. A number of NEDO Economic Development Committees have brought together key public bodies and the UK suppliers to tackle areas of mutual interest.

Public Finance for Innovation

8 The Committee welcomed my Department's increase in the provision for R&D expenditure in civil industry but expressed concern on two issues. The first was the level of R&D support in civil industry compared, in the per capita terms, with that provided by our competitors. As Lord Kings Norton stated during the oral evidence the inconsistencies in the ways in which R&D figures are presented "illustrates the fact that international comparisons are extremely difficult to make." Examination of the pattern of R&D support in a wide variety of countries does not show any correlation between the level of Government support for

industry's research and development and economic prosperity. We have demonstrated our belief in the role that Government can play in the support of R&D by the increases that we have made in Government finance in recent years. For the longer term, however, we are convinced that industry would prefer a situation in which it was sufficiently profitable to finance much the greater part of its own innovation.

9 On the second point, concerning funding for defence R&D, it is true that it has increased in recent years. This funding is of course a public sector responsibility whereas civil R&D is paid for mainly by private industry. Over two-thirds of all defence R&D is now, however, conducted in the private sector. The Government fully ensorses the need for positive steps to enchance the level of significant civil spin-off. To this end, negotiations are in an advanced state between the Ministry of Defence and Lazard Brothers and a number of venture capital houses and banks on proposals to mobilise private capital and resources in a company to be called "Defence Technology Enterprises", for the identification of innovative technology in the work of the defence Research Establishments and its future development for the civil market. Discussions are also taking place with industry on arrangements to facilitate increased spin-off of industry-owned Intellectual Property arising from Defence-funded contracts.

10 The subject of licensing-in technology was raised by the Committee. The Government fully recognises the need for British industry to make good use of the possibilities for buying-in appropriate technologies from overseas. We prefer that the Support for Innovation grants mentioned by the Committee should lead to some enhancement in the UK of the licenced technology, but this is not a hard and fast requirement. As with all applications for SFI support the individual projects are judged on their merits within broad and flexible guidelines.

11 The Committee suggested a role for the British Technology Group (BTG) in relation to licensing. One of the tasks of BTG, as announced by Cecil Parkinson on 30 September 1983, is to help industry and financiers identify technology of potential interest to them. This service is aimed particularly towards small and medium sized companies, and is carried out either by a new database or through active search. It is part of the BTG's main role of helping to translate into commercial products new research ideas, coming mainly, but not exclusively, from the UK public sector.

12 The BTG's Corporate Plan, recently submitted to Government, is now being considered.

Private Funds for Innovation

13 The Select Committee suggested that the Business Expansion Scheme (BES) should be extended to include investments by

individuals in research and development companies which are either subsidiaries of, or associated with, listed companies. The BES is designed to encourage equity investment by outsiders in unquoted trading companies. It achieves this by providing income tax relief at very generous levels. Quoted companies are excluded from the Scheme because they have access to the stock market for new equity and so do not have the same difficulties. The BES is therefore targetted at the type of company most needing assistance. Because of the nature of the Scheme, various rules prevent subsidiaries of quoted companies from qualifying. It would not be right to change these, as there would be nothing to prevent new equity raised under BES from flowing to other non-qualifying members of the same group. However, in its present form the BES is a possible vehicle for the type of R&D ventures suggested by the Select Committee. For instance an unquoted company would qualify under the scheme if it, say, undertook work on contract for a quoted company which had less than 51% shareholding in the unquoted company. Such a company could be set up by a consortium of quoted companies provided none individually had control.

14 The problems of financing innovation were discussed at the Prime Minister's Seminar on Science, Technology and Industry and this has been followed with a study by an ACARD group. ACARD will be reporting to the Prime Minister shortly and we shall give very careful consideration to the results of their study.

Education and Industry

15 Your final recommendation called for a greater measure of selectivity in the support of university research and you referred to the Secretary of State for Education and Science's call to the UGC for a strategy in higher education. The UGC response has now been published and the Secretary of State for Education and Science is taking account of this and other advice in formulating his proposals for the development of higher education which he plans to publish in a Green Paper at the turn of the year.

16 The Research Councils are already selective, basing their selection on the merit of research proposals. This ensures that funding is concentrated in those university departments that have demonstrated their ability in any given field. But the system is not rigid and allows for changes as the staff and scientific interests of Departments change. Both the UGC and the Research Councils must have regard to the need to maintain a broad capability in university departments for education purposes. However, the need to ensure that the best value is obtained from the available resources leads to the sort of concentration that the Select Committee seeks.

17 I hope that you will find from this response that the Government shares the Committee's views on many issues. As Mr Baker said on 14 March there is little difference between the views

of the Select Committee and the Government in the method of implementation of our policies. It is certainly the case that we share a common goal of seeking to maintain a strong British manufacturing industry. The Government greatly appreciates the time that the Committee has spent considering this important subject and has found the suggestions made valuable in helping to formulate future policies.

GEOFFREY PATTIE

JH2AWR

Parliament : Select Com on Science & Techn; int'l aff.

Lords

NOV 1979.

CCND

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PS/ *Secretary of State for Trade and Industry*

11 Septemmber 1984

John Gieve Esq
Private Secretary to the
Chief Secretary
HM Treasury
Parliament Street,
LONDON
SW1P 3AG

11/9

Dear John.

DRAFT GOVERNMENT RESPONSE TO THE HOUSE OF LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY: SUPPLEMENTARY REPORT ON ENGINEERING R&D

Thank you for your letter of 3 September 1984 requesting an amendment be made to the above.

2 We are happy for the amendment to be made and, subject to any comments made by the Prime Minister, will ensure it is included in the final response when it is sent to Lord Gregson.

3 Copies of this letter go to the Private Secretaries to the Prime Minister, the Secretary of State for Education and Science, the Chancellor of the Duchy of Lancaster and the Secretary to the Cabinet.

Yours ever

A. D. Lansley

ANDREW D LANSLEY
Private Secretary

JH4AGV

Parliament Nov. 79

Select Committee on Science

file DCDAFS

10 DOWNING STREET

From the Private Secretary

10 September 1984

Draft Response to House of Lords Select Committee on Science and Technology

The Prime Minister has now considered your Secretary of State's minute of 9 August to which was attached a draft response to a Supplementary Report from the House of Lords Select Committee on Science and Technology.

The Prime Minister is generally content with the proposed response, subject to one reservation. This relates to the passage in paragraph 9 of the draft, about the civil spin-off from defence R&D. The Prime Minister considers that this passage may be over optimistic in describing the current extent of civil spin-off as "significant". She further believes that the reference to "initiatives" to increase spin-off may give rise to exaggerated expectations, in view of the apparently slow rate of progress to date (for example with the proposed city-led technology exploitation initiative).

The Prime Minister would therefore be grateful if your Secretary of State could consider redrafting the passage to make clear that the Government accepts the pressing need to increase the current level of civil spin-off. It might also go on to describe in a little more detail the action that is in hand.

I am sending copies of this letter to Margaret O'Mara (HM Treasury), Elizabeth Hodkinson (Department of Education and Science), Alex Galloway (Chancellor of the Duchy of Lancaster's Office) and Richard Hatfield (Cabinet Office).

David Barclay

Andrew Lansley, Esq.,
Department of Trade and Industry.

PRIME MINISTER

CIVIL SPIN-OFF FROM DEFENCE R&D

Robin Nicholson shares your doubts about the passage in the draft Government response to the House of Lords Select Committee which refers to the civil spin-off from defence R&D (see attached note).

I suggest a response along the following lines:

(i) You are grateful to the Secretary of State for his minute, and content with the proposed response, subject to one reservation.

(ii) Your reservation relates to the passage in paragraph 9 of the draft on the civil spin-off from defence R&D. You think this may be over-optimistic in describing the current extent of civil spin-off as "significant"; and that the reference to "initiatives" to increase spin-off may give rise to exaggerated expectations, in view of the slow rate of progress to date (e.g. with the proposed technology exploitation unit).

(iii) The passage should therefore be redrafted to make clear that the Government accepts the pressing need to increase the current level of civil spin-off. It should go on to describe in a little more detail the action that is in hand.

Agree? Yes no.

DWB

6 September 1984

W.0605 4 September 1984

MR DAVID BARCLAY, NO 10

DRAFT GOVERNMENT RESPONSE TO THE SUPPLEMENTARY REPORT FROM THE HOUSE OF LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY ON ENGINEERING R&D

In your letter of 3 September, concerning the Government's response to the Supplementary Report from the Lords Select Committee on Science and Technology, you set out some additional questions raised by the Prime Minister.

2. On the question of civil spin-off from defence R&D, the phrase used in the draft Government response "there is significant civil spin-off" is somewhat dismissive of the Select Committee's fears and many would also view it as inaccurate. For example, the Advisory Council for Applied Research and Development (ACARD), in their comments on the Annual Review (Sir Robert Armstrong's minute to the Prime Minister of 23 July) said that "in general, we do not think that spin-off from defence to non-defence industry in the UK is significant in national terms". They went on to say, (and I agree) that it should be encouraged, but recalled that Sir Ieuan Maddock's report on the subject to the NEDO Electronics EDC"showed that many defence contractors have little incentive to exploit defence technology in civil markets, and are not equipped to do so."

3. The initiatives to increase civil spin-off, referred to in the Government response, are those which will enact the statement made by the Secretary of State for Defence, at the Prime Minister's seminar in September 1983 that new ways of exploiting ideas generated in defence R&D establishments would be explored. It is disappointing that a go-ahead for the city-led technology exploitation initiative has yet to be announced, a year after the original statement.

4. Bringing private sector investers into defence R&D establishments to seek out developments which could be exploited in private sector industry is, of course, welcome, but it only begins to scratch the surface of the problem. While so much defence research continues to be carried out in MOD establishments, and so much defence development is carried out in industry under contract and at no risk to the company, the low level of

spin-off must be expected to continue.

5. Frankly I believe that a significant improvement will only occur if defence procurement changes radically from the present system where Government pays first for the research, then for the development and finally for the equipment, to a more normal commercial arrangement where Government buys defence goods at a price which allows the manufacturer to carry out and pay for his own R&D. Only then does the manufacturer have a real incentive to do his R&D efficiently and exploit it to the limit in other defence and civil markets.

6. It was considerations such as these which led me to suggest to the Prime Minister in my comments on the Annual Review of Government R&D (my minute of 27 July) that it would be instructive to examine the consequences of reducing defence R&D expenditure to half its present level with simultaneous changes in the procurement system. You have indicated (your minute of 6 August to Sir Robert Armstrong) that the Prime Minister would wish this philosophy to be examined by the committee to be set up by Sir Robert Armstrong to examine the ACARD comments on defence R&D.

7. In these circumstances, there is little which is constructive to be said to the House of Lords Select Committee at the present time although many, with some justification, might view the present draft of the Government response as unduly complacent. Because of the actions in hand I would advise only a minor watering down of the offending passages.

RBN.

ROBIN B NICHOLSON
Chief Scientific Adviser

Treasury Chambers, Parliament Street, SW1P 3AG

3 September 1984

M C McCarthy Esq
Principal Private Secretary to
Secretary of State for Trade & Industry
Department of Trade and Industry
1 Victoria Street
LONDON
SW1

DMB
4/9

Dear Colleague

GOVERNMENT RESPONSE TO THE SUPPLEMENTARY REPORT ON ENGINEERING R & D

Your Secretary of State copied to the Chief Secretary his minute to the Prime Minister of 9 August seeking approval for the above draft response.

2 The Chief Secretary has asked me to seek one drafting amendment. Paragraph 6, second sentence, is not at present an accurate description of the public procurement initiative. We suggest the addition of a final phase as follows:

> " ... purchasing operations, subject to the requirment that this should provide the purchaser with improved value for money over the longer term."

3 Copies of this letter go to the Private Secretaries to the Prime Minister, the Secretary of State for Education and Science, the Chancellor of the Duchy of Lancaster and the Secretary to the Cabinet.

Yours sincerely

J. Gieve

JOHN GIEVE

10 DOWNING STREET

From the Private Secretary

DR. NICHOLSON
CABINET OFFICE

The Prime Minister considered over the weekend the minute of 9 August from the Secretary of State for Trade and Industry about the Government's response to the Supplementary Report from the House of Lords Select Committee on Science and Technology. She was grateful for your comments on the draft response, contained in your minute of 30 August.

The Prime Minister has queried the reference in paragraph 9. of the draft response to a "significant civil spin-off" from defence R&D, and she also wonders whether the initiatives to increase the spin-off, to which the draft also refers, are really of much significance.

I should be grateful for your thoughts on these points, before I take them up formally with the Department of Trade and Industry.

David Barclay
3 September 1984

10 DOWNING STREET

Prime Minister:

Sorry to return this, but had you approved it?

31/1

- Please note comments - Para 9
- otherwise agreed

W.0587 30 August 1984

PRIME MINISTER

GOVERNMENT RESPONSE TO THE SUPPLEMENTARY REPORT FROM THE HOUSE OF LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

I have seen the draft response to the Supplementary Report on Engineering R&D from the House of Lords Select Committee on Science and Technology; also the minute of 9 August from the Secretary of State for Trade and Industry seeking your approval for the content and form of the response.

2. My view is that this is a reasonably satisfactory reply to the Select Committee. It is appropriate to make it low key, as it would be inadvisable to make any points that differed in matters of substance from the original Government response. I am pleased to see that the letter, which constitutes the response, is being sent by the Secretary of State rather than by the Minister of State, since part of the problem has been convincing the Select Committee that Government gives engineering R&D and manufacturing industry the attention it deserves.

3. Having said this, I do have more private reservations about the implementation of the research programme of the Department of Trade and Industry. It is difficult to discern a strategy behind DTI's R&D programme - as the Advisory Council for Applied Research and Development (ACARD) pointed out in their comments on the 1984 Annual Review of Government-funded R&D. The Select Committee welcomed some recent DTI initiatives (eg the Alvey, microelectronics and biotechnology programmes) but, overall, there is a tendency for DTI to use its funds to support small, short-term, industrial R&D projects covering almost every type of technological advance - an opportunist flavour-of-the-month approach. The Select Committee's concern that longer-term projects of relevance to industry were losing out to this

almost random approach must not be forgotten. But this is a subject that will be considered as part of the follow-up to this year's Annual Review of R&D, in the context of ACARD's concern that the UK is under-committed in basic and strategic research relevant to manufacturing industry.

4. I am copying this minute to Sir Robert Armstrong.

RBN

ROBIN B NICHOLSON
Chief Scientific Adviser

Cabinet Office
30 August 1984

Post.: Enquiry into Science + Govt 11/79

Pre Minister.

Agree this response?

Dr Nicholson, whose comments are flagged, endorses it.

JF 30/8

PRIME MINISTER

I attach, for your approval, a draft response to a Supplementary Report from the House of Lords Select Committee on Science and Technology. The Supplementary Report was sent to Kenneth Baker on 24 May and simultaneously published by the Select Committee; my Department has co-ordinated the Government's response.

BACKGROUND

2 The Select Committee issued a Report on Engineering R&D on 9 March 1983, to which the Government replied on 31 October 1983. The Committee expressed some dissatisfaction with the Government Response and invited DTI Ministers to give further oral evidence which Kenneth Baker did on 14 March 1984.

3 The Supplementary Report concentrates on four main areas of contention between the Select Committee and the

JH2AWS

Government.

i) the need for a national "technological strategy";

ii) the level of public funding for civil industrial R&D, which is below that of our competitors;

iii) measures to stimulate private funding for R&D;

iv) the need for greater selectivity in the university sector.

These points were dealt with in the oral evidence of 14 March 1984 and the response therefore reiterates what was said then.

4 My officials have discussed with the Clerk to the Select Committee what form of response might be appropriate. He has indicated that it could take the form of a letter from me to the Chairman, Lord Gregson. The Select Committee will decide whether to publish the response.

5 Copies of this minute, and the draft response, go to

JH2AWS

Nigel Lawson, Keith Joseph, Arthur Cockfield and to Sir Robert Armstrong.

NT

N T

9 August 1984

Department of Trade and Industry

JH2AWS

DEPARTMENT OF TRADE AND INDUSTRY
1-19 VICTORIA STREET
LONDON SW1H 0ET
Telephone (Direct dialling) 01-215) 5422
GTN 215) .....
(Switchboard) 215 7877

DRAFT

Secretary of State for Trade and Industry

August 1984

Lord Gregson
House of Lords
London SW1

GOVERNMENT RESPONSE TO THE SUPPLEMENTARY REPORT ON ENGINEERING R&D

Your Select Committee wrote to Kenneth Baker with a Supplementary Report commenting on the Government response to your Report on Engineering R&D. I am now writing in reply to the points that the Select Committee made.

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issues. The purpose of such studies is to identify trends which will, over the next 10 to 20 years, be key influences on the manufacturing and commercial sectors of the economy. The group maintains close contact with strategic planning groups in industry, the universities and business schools as well as with the Research Councils, professional institutions and international bodies. We will continue to contribute towards the development of the next generation of key technologies, subject to the essential constraints on public expenditure, particularly through opportunities identified by the group, by ACARD, the Research Councils, and your Select Committee.

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in the support of R&D by the increases that we have made in Government finance in recent years. For the longer term, however, we are convinced that industry would prefer a situation in which it was sufficiently profitable to finance much the greater part of its own innovation.

9 On the second point, concerning funding for defence R&D, it is true that it has increased in recent years. This funding is of course a public sector responsibility whereas civil R&D is paid for mainly by private industry. Two-thirds of all defence R&D is now, however, conducted in the private sector. There is significant civil spin-off and you will be aware of the initiatives that the Secretary of State for Defence is taking to increase this spin-off.

Is this correct?

I thought they were minimal

10 The subject of licensing-in technology was raised by the Committee. The Government fully recognises the need for British industry to make good use of the possibilities for buying-in appropriate technologies from overseas. We prefer that the Support for Innovation grants mentioned by the Committee should lead to some enhancement in the UK of the licenced technology, but this is not a hard and fast requirement. As with all applications for SFI support the individual projects are judged on their merits within broad and flexible guidelines.

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Education and Industry

15 Your final recommendation called for a greater measure of selectivity in the support of university research and you referred to the Secretary of State for Education and Science's call to the UGC for a strategy in higher education. A response from the UGC is expected in late summer 1984 and will be published.

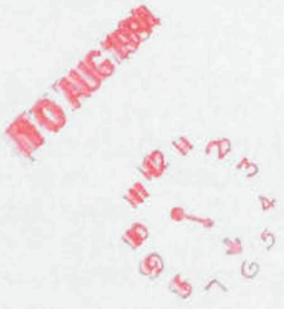
16 The Research Councils are already selective, basing their selection on the merit of research proposals. This ensures that funding is concentrated in those university departments that have demonstrated their ability in any given field. But the system is not rigid and allows for changes as the staff and scientific interests of Departments change. Both the UGC and the Research Councils must have regard to the need to maintain a broad capability in university departments for education purposes. However, the need to ensure that the best value is obtained from the available resources leads to the sort of concentration that the Select Committee seeks.

17 I hope that you will find from this response that the Government shares the Committee's views on many issues. As Mr Baker said on 14 March there is little difference between the views of the Select Committee and the Government in the method of implementation of our policies. It is certainly the case that we share a common goal of seeking to maintain a strong British manufacturing industry. The Government greatly appreciates the time that the Committee has spent considering this important subject and has found the suggestions made valuable in helping to formulate future policies.

JH2AWR

NORMAN TEBBIT

Scient & Tech. Com. PART. Nov 79



10 DOWNING STREET

From the Private Secretary

24 February 1984

DEBATE ON ACARD/ABRC JOINT CHAIRMEN'S REPORT

The Prime Minister was grateful to the Lord President for his minute of 22 February reporting on the House of Lords debate. She has noted the points made and has asked Dr. Nicholson, to whom I am copying this letter, to examine what practical steps the Government could take, other than simply increasing funding, to meet the points raised.

I am sending copies of this letter to Elizabeth Hodkinson (Department of Education and Science), Callum McCarthy (Department of Trade and Industry), Lord Lucas (Government Whips Office) and Richard Hatfield (Cabinet Office).

(ANDREW TURNBULL)

Miss Janet Lewis-Jones,
Lord President's Office.

10 DOWNING STREET

Prime Minister (2)

Agree

(i) I thank Lord Whitelaw for his report Yes

(ii) I ask Dr Niddon whether there is anything specific, other than providing more money, which Government can be doing.

MI AT 23/2

Yes

PRIME MINISTER

DEBATE ON ACARD/ABRC JOINT CHAIRMEN'S REPORT

I mentioned to you last week that on 10 February I wound up for the Government in the debate initiated by Lord Sherfield on the first joint report of the Chairmen of ACARD and ABRC (Cmnd 8957). I told the House that I would be discussing the points raised in the debate with Dr Robin Nicholson. I have now done this and thought, therefore, that I should briefly report to you and colleagues on the main themes.

First, there was a real concern on all sides about the effect on research of the cuts in university funding. It was accepted that the value of the Science Vote had been maintained in real terms but speakers repeatedly asserted that this was now having to pay for equipment, materials etc that would previously have been provided from University Grants Committee (UGC) funds. Volume is not all - but many speakers declared that first class research proposals could not now be funded. I formed the clear view that the Government's case on its funding of university research was becoming increasingly difficult to sustain.

Government, of course, is not the only source of university research funds; several speakers pointed out the way that universities were increasingly turning to industrial and other sources of income. Lord Zuckerman spoke impressively about the work of the Wolfson Foundation and there were approving references to the report by ACARD and ABRC on research links between higher education and industry, with its proposals for stimulating such linkages. When I spoke, I naturally sought to encourage these new relationships.

Secondly, and related to the concern above about university research, there was considerable disquiet about the funding of "strategic" research and many references to Sir Ronald Mason's report to ABRC on the arrangements by which Departments commission research from Research Councils. Quite clearly, many speakers agreed with Sir Ronald that strategic research was under threat. They saw, on the one hand, departmental research budgets being squeezed, and consequently Departments concentrating on their short-term priorities; simultaneously the constraints on university research were causing this to concentrate on the more fundamental areas of science (for which this is the only source of support). Dr Nicholson informs me that preliminary information from the 1984 Annual Review indicates that just such a squeeze on strategic research might be happening. I should perhaps add that there were many complimentary references to the 1983 Review, for which the Government can take credit.

Thirdly, the decline in the United Kingdom's manufacturing performance, and the relatively low level of expenditure on industrial R & D, both by Government and industry, was much commented on. A number of speakers referred to the need to place industrial R & D within a broader strategy for industrial development. This is not a route that we would wish to follow unless industry itself led the way, and I said as much in my closing remarks. It was, however, interesting to note that several speakers accepted that it would be desirable if industry could give such a lead in this respect and perhaps we may see some more concerted views coming forward.

Finally, there were many references to Dr Nicholson's role in the Cabinet Office and the role of other Chief Scientists. I think that I satisfied the House that the changes recently instituted, in strengthening the Cabinet Office's support for Dr Nicholson and in other directions, have much improved the provision of scientific advice to the Government.

Personally, I found the debate of great interest. It introduced me to many matters of which I had not previously been aware and which must surely be of vital importance to our future. The eminence of the speakers demonstrated the concern in the House for science and technology. There was much appreciation of your own understanding of these matters and for your Lancaster House initiative and I was able to assure the House of your close and continued interest.

I was pressed to ask you to read the debate in full but this seems an unfair infringement of your time. I am, however, attaching a copy of Lord Flowers' speech which encapsulates several of the key points and is helpful in its understanding of what Government can and cannot do.

I am sending copies of this minute to Keith Joseph, Norman Tebbit, Michael Lucas (who opened the debate for the Government) and to Sir Robert Armstrong.

22 February 1984

DEPARTMENT OF TRADE AND INDUSTRY
1-19 VICTORIA STREET
LONDON SW1H 0ET
TELEPHONE DIRECT LINE 01-215 5422
SWITCHBOARD 01-215 7877

JU553
Secretary of State for Trade and Industry

Sir Robert Armstrong
Cabinet Office
70 Whitehall
SW1

26 September 1983

NBPM
MLS 27/9

Dear Robert,

HOUSE OF LORDS REPORT ON ENGINEERING R&D

Thank you for sending me a copy of your minute of 7 September to the Prime Minister with the draft response to this report.

2 I am content with the text, with the exception of paragraph 25 which includes a reference to DTI and MOD considering jointly financing a study by management consultants into ways of enhancing technology transfer to the civil sector. The case for this study is still not agreed between the two Departments. My officials and those of the Ministry of Defence have agreed a draft to replace the current text and I understand that the Secretary of State for Defence will be writing to you about this shortly.

3 I would be happy to sign a covering letter to the response as you suggest if the Prime Minister agrees.

4 I am sending copies of this letter to the Chancellor of the Exchequer and the Secretaries of State for Education and Science, Energy, Defence, the Environment, Employment, the Chancellor of the Duchy of Lancaster, and to the Secretary of State for Transport.

Yours ever,

Len

PARLIAMENT: House of Lords Cttee
on Sci + Tech
Nov 79

RESTRICTED

Prime Minister (4)

Chancellor of the Duchy of Lancaster

MLS 14/9

PRIME MINISTER

HOUSE OF LORDS REPORT ON "ENGINEERING R AND D"

1. The draft produced by Sir Robert Armstrong covers the ground very adequately and very well.

2. I am not too happy however about the way that paragraph 4 is drafted ("The Government therefore seeks the same ends as the Select Committee but, as detailed below, has reservations over some of the particular means proposed by the Committee.") This is entirely correct: but it leaves the reader with the impression that he is now going to be faced with 20 pages of criticism. This would be an unfair reaction as in fact a great deal of what is said in the rest of the response details specific measures the Government has taken to help.

   I had the same problem when I came to draft my own speech. The only way of overcoming this difficulty involves some repetition; but a degree of tautology is better than leaving Lord Gregson or his colleagues feeling that we are unappreciative of their efforts. I suggest:

   > "The Government therefore seeks the same ends as the Select Committee. They have reservations about some of the specific proposals made by the Select Committee. But there are many areas where they share the Select Committee's approach."

3. Gregson is an engineer, not a scientist and the same is true of most of his Committee. The engineers feel that they have lost out compared with the scientists and this has coloured their Report. It is not necessary to deal with this point in the response. But it does shed some light on the bias which sometimes intrudes in the Report.

4. I am copying this minute to the recipients of Sir Robert Armstrong's minute of 7 September and to Sir Robert.

A.C.

A C

14 September 1983

RESTRICTED

Parliament: House of Lord
Select Cttee
on Science + Tech
+ Engineering Rep.
Nov 79.

RESTRICTED

PLR SH CT

10 DOWNING STREET

From the Private Secretary

12 September, 1983

The Prime Minister has now seen Sir Robert Armstrong's minute of 7 September with which he enclosed a draft response to the Report of the House of Lords Select Committee on Science and Technology on "Engineering Research and Development". Subject to the views of Ministers, the Prime Minister has agreed that the response may be made public in the way proposed in the minute.

TIMOTHY FLESHER

R. Hatfield, Esq.,
Cabinet Office

RESTRICTED

Prime Minister:

Agree to this draft response, which is largely the work of Robin Nicholson. You need not look at it in any detail.

Ref. A083/2531

PRIME MINISTER

House of Lords Report on "Engineering R and D"

The House of Lords Select Committee on Science and Technology published a report on "Engineering Research and Development" on 22 February, the conclusions and recommendations of which are summarised on pages 68-72. A copy is attached, together with a draft Government response.

2. While many of the report's recommendations were addressed to the then Department of Industry, a number involved the interests of other Departments. Preparation of the response was therefore co-ordinated by Dr Robin Nicholson, using the machinery of the Sub-Committee of Chief Scientists.

3. The Select Committee report was not of the highest quality. It recommended a national strategy for technology and manufactured products which would run completely counter to the Government's view that market considerations should guide the support of technological developments and new products. And many of its recommendations failed to acknowledge initiatives that the Government have already taken. A low-key response has therefore been prepared, significant elements which have already been made public through Lord Cockfield's speech in reply to the House of Lords debate on the report on 4 July.

4. If you and other Ministers are content with the draft response, it would seem appropriate, given the Department of Trade and Industry's major interest in this subject, for the Secretary of State for Trade and Industry to send it as a memorandum to the Chairman of the Select Committee under a covering letter and subsequently, with the agreement of the Chairman, to make the response public.

5. I am sending copies of this minute and the draft response to the Chancellor of the Exchequer and to the Secretaries of State for Education and Science, Energy, Defence, the Environment, Employment, and Trade and Industry, to the Chancellor of the Duchy of Lancaster, and to the Secretary of State for Transport.

7 September 1983

ROBERT ARMSTRONG

DRAFT

GOVERNMENT RESPONSE TO THE HOUSE OF LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY REPORT "ENGINEERING RESEARCH AND DEVELOPMENT"

PREFACE

1 The Government has given careful consideration to the recommendations of the Select Committee. This memorandum responds to each recommendation, but in order to avoid repetition, the recommendations have been grouped under common themes; the heading of each section indicates the numbers of the recommendations addressed in the subsequent text.

OBJECTIVES (Recommendation 1)

2 The Government fully endorses the Select Committee's view that the United Kingdom cannot do without a vigorous, competitive and successful manufacturing sector. It agrees that an important element in such competitiveness is a sustained R & D effort. And it entirely supports the Committee in its statement that the first essential for such R & D is real profitability in industry, coupled with a climate of confidence that encourages investment and innovation. The economic policies followed by Government over the past four years have had, as an objective, the creation of just such a climate.

3 The Government has initiated and expanded many schemes to provide financial assistance for the development and application of new technology, some of which have reflected recommendations in reports from the Advisory Council for Applied Research and Development (ACARD) and other bodies. It has also responded to the proposals in the report of the Finniston enquiry (Cmnd 7794) into the engineering profession, and it has

pursued a vigorous programme to encourage public purchasing agencies to

use their purchasing power to promote the competitiveness of British products.

4 The Government therefore seeks the same ends as the Select Committee but, as detailed below, has reservations over some of the particular means proposed by the Committee.

SELECTIVITY AND STRATEGY (Recommendations 2-4)

5 The Committee recommended that the Government should devise a national strategy for industry and technology, which would designate those sectors and technologies on which industry should concentrate. Through the National Economic Development Office (NEDO) and with the advice of bodies such as ACARD, R & D priorities would then be drawn up and a more selective approach, supported by resource allocations, public purchasing decisions, etc, pursued.

6 While accepting that this country cannot expect to be pre-eminent in all sectors of manufacturing, the Government cannot agree with this approach. In the Government's view, primary responsibility for decisions about the products to be marketed, and the R & D necessary to obtain those products, must rest with industry itself, which alone can respond to market forces and identify technological areas and products which show the most commercial promise. When firms are unable to commit sufficient resources to implement their product decisions, Government can and does provide support, through for example the "Support for Innovation" programme of the Department of Trade and Industry (DTI). Moreover, it has indicated general areas of technology which it believes to be of major importance in the future - information technology and biotechnology, for example - and has promoted initiatives such as IT Year to draw to the attention of both customers and suppliers of IT products the need for appropriate investment in new technology. It is then up to individual firms to decide how they can exploit the market opportunities thus opened.

7 DTI support for the development and application of new technology has been recently strengthened and expanded. It focuses on "enabling" technologies

which can be applied across a wide range of industries and to a large number of products. The programmes can be deployed flexibly to support firms with worthwhile applications in any sector.

8 In developing these programmes, the Government has taken into account the advice received from ACARD, Requirements Boards, NEDO and other bodies and it will continue to look to such bodies - and to the Select Committee - as sources of informed advice. The Government notes the Select Committee's proposal that the Fellowship of Engineering should undertake relevant studies.

9 The Select Committee will know that, in response to their previous report "Science in Government", the Government has introduced measures to ensure that its own R & D expenditure is appropriately deployed. There is to be an annual review of research, conducted as part of the Public Expenditure Survey (PES) cycle, with advice from ACARD. In addition, the Chairmen of ACARD and the Advisory Board for the Research Councils (ABRC) have been invited to prepare periodic joint reports commenting on scientific and technological opportunities and reflecting the outcome of the annual reviews. These measures will add to the Government's effectiveness in supporting industry's decisions.

10 The Government has placed emphasis on the role of public purchasing in promoting the competitiveness of UK products and encouraging the development of new technology. Guidance to assist Departments in carrying out the Government's purchasing policy was issued by the Treasury in 1981. Funds are available, within the "Support for Innovation" programme, to assist the introduction of new products and processes by UK public sector bodies. A major development of this concept has been the "Office of the Future" programme in which advanced office technology systems have been sponsored in 21 public sector locations in order both to provide showcases for their suppliers and to help create an informed market amongst users. This programme is budgeted at £6 million. More generally, "pre-production" orders provide a valuable means of introducing new technology to potential users. These finance the initial placing of new, untried equipment with

users who purchase it later if it proves successful.

PUBLIC FUNDING FOR INNOVATION (Recommendations 5, 12(i) - (vii), 13, 14, 26 - 29, 32)

Levels of support (Recommendations 5, 12(i), (iii) and (vi))

11 The Government welcomes the Select Committee's endorsement of the "Support for Innovation" programme. The higher rate of grant (33 1/3 per cent) introduced in 1982 is being continued for a further year and the resources available to the scheme have been increased substantially. Between 1978/79 and 1982/83, the sums spent by the DOI in support of R & D in industry increased from £36.5 million to £122 million and there is provision for spending about £200 million in 1984/5. The scheme is now being marketed more intensively and this has led to an increase in the number of applications. The Government has therefore demonstrated its willingness to support projects with sound commercial prospects and in particular those that would lead to internationally tradeable products but it believes that companies must also show their confidence by providing a substantial part of the funds; they must also be able to finance the subsequent exploitation of the results of the project. The Government cannot accept the Committee's proposals for 90 or 100 per cent funding for work of this type. It does however recognise that public funds may have a particular role to play in the support of long term R & D and in bridging the gap between basic research and industrial application. The Research Councils already fund basic research in higher education institutions (HEIs) at the 100% level. A variety of mechanisms exist to transfer the results of such work to industry by co-operative ventures and the Government's recent broad endorsement of the Alvey Committee proposals demonstrate its willingness to work with industry in this way. The Select Committee's call for a substantial increase in support for engineering R & D must be seen against this background.

12 The Committee, in commenting on such long-term projects, expressed the view that they were unlikely to be undertaken except by a relatively few profitable companies and recommended that companies should be encouraged

to form consortia, either on an international basis or within this country. The Government agrees that co-operative arrangements can be an appropriate way to finance large scale R & D. Such arrangements present obvious difficulties, however, even within the same country, and these difficulties could be much greater at the international level. It is essential that commercial judgement should predominate and where firms do wish to proceed in this manner, the Government welcomes such developments. DTI Research Requirements Boards have sometimes been able to stimulate the creation of consortia in order to undertake a development. There are many successful "club" arrangements in DTI laboratories and elsewhere. DTI and other Departments support the Research Associations. The European Community can play an important part in promoting co-operation, and the Government welcomes the valuable work of the ESPRIT programme, a collaborative research programme in R & D between major electronics firms.

Conditions of support (Recommendations 12(vii), 29, 32)

13 The Committee's report draws on experience of the Government support schemes going back several years. In the last year or so, DOI has reviewed and streamlined application procedures considerably, particularly for applications from small firms for assistance with small projects. DOI guidance notes now say that projects below the £25,000 threshold are welcome from small firms and decisions on such applications have been delegated to Regional Offices. The Small Firms Service is an information and counselling service only and is not set up to handle applications for grants, although where appropriate it helps small firms to prepare their applications. In general, average appraisal times have fallen from around six months in 1979 to around three months now and are still falling. Urgent cases can be processed more rapidly if necessary.

14 In order to ensure that the limited amount of public funds available for R & D are put to best use, the Government considers that the "additionality" criterion should remain. The intention is that the Government's contribution should lead to action over and above what would otherwise happen, for example, to help a small company undertake a project it would otherwise find difficult to finance or to ensure that a project

is completed more quickly. The arrangements for assessing additionality have been streamlined, particularly for smaller projects, and so it should not constitute a major obstacle. The "no prior start rule" stems from the additionality criterion. It means that a company should not start on those parts of the work for which it is seeking assistance. There is no bar to carrying out feasibility studies or preliminary stages of an R & D project in advance, although these would not be eligible for grant.

15 The rule debarring support for parallel projects is criticised by the Committee. The Government's view is that it is inappropriate for public funds to be used in competing projects. In general, the first project that is received that is of acceptable standard would be supported; related proposals might receive support if they prove to be significantly different or aimed at another market, or would help another UK company break into an important market.

16 As for the risk associated with the projects receiving Government support, the application of the additionality rule ensures that Government is not funding projects able to attract sufficient commercial support and therefore the risk element is greater.

17 DTI keeps its procedures for handling applications under review and had already made changes or clarified the guidance notes in areas covered by the Committee. The Government is not therefore persuaded that further changes are needed.

The organisation of support (Recommendations 12(ii), 26, 28)

18 The Government agrees with the Committee that, even when supported by public funds, industrially-relevant applied research and product development should be carried out, as far as possible, in industry itself. This policy has been vigorously implemented by the DTI through a substantial reduction in real terms in its expenditure at its own Research Establishments with a corresponding increase in the amount spent directly in industry. (A similar policy has been pursued in the Ministry of Defence, see paragraph 28.) Furthermore, DTI Establishments are encouraged

to provide services to industry where these are not in competition with the private sector. There are also important functions which Government laboratories should perform in support of industrial engineering. These include the maintenance and dissemination of measurement standards, longer term applied research and the provision of generic technology, and work to support Government technology policy. The research programmes of many of the Government's civil research establishments are already reviewed under arrangements which provide strong industrial and academic advice.

19 The Committee consider that a separate Engineering R & D Council would not be desirable; the Government concurs with this view. Requirements Boards advise on the suport for the development of new products and systems, acting in response to the market perceptions of firms. DTI frequently reviews the role and operation of its Requirements Boards to take account of changing technical circumstances.

Demonstration projects (Recommendation 12(v))

20 The Government agrees with the Committee on the value of demonstration projects. In defence, technology demonstrators have often performed a useful role in showing how technologies may be applied before project development is initiated; examples include gas turbines and electronic sub-systems. Demonstration projects have also been widely used in industrial energy conservation where there has been the Energy Conservation Demonstration Projects Scheme administered jointly by DTI and the Department of Energy.

Research Associations (Recommendations 12(iv), 29)

21 The Committee suggested that Research Associations (RAs) should be able to receive funds from SERC. This would run counter to the Council's principal role of supporting HEIs. However, RAs may be the industrial partner in collaborative research programmes carried out with a HEI.

22 The Committee also suggested that Requirements Boards might support more "common ground" R & D. The Boards already support a large programme of

generic research, notably at the RAs, and this has increased in real terms over the last decade. DTI is reviewing its support for RAs and has already introduced a simpler system of funding for basic research.

Nationalised Industries (Recommendation 27)

23 The Government agrees with the Committee that the private sector should undertake a greater share of the R & D which is presently carried out by the nationalised industries. This is in line with the findings of the ACARD report on R & D for public purchasing, which the Government strongly endorsed. The Government understands that ACARD will be setting in hand the review of the impact of its report, recommended by the Committee. However, it is recognised that the private sector may have difficulty in performing some of the research carried out by the energy industries in direct support of their operations.

Interaction between defence and civil research (Recommendations 13, 14, 28)

24 The primary purpose of the Defence R & D programme, including the work of the Defence R & D Establishments, is to support the procurement of the weapons and equipment needed for the Armed Forces in a timely and cost-effective manner. The Government continues to seek ways of promoting the transfer of technology from defence to the civil sector. The circle of firms eligible to compete for defence contracts is already very wide; the essential criterion is not size but competence to undertake the work in question. At any one time the Ministry of Defence (MOD) has direct contracts with over 10,000 UK companies and the number of sub-contractors involved in these contracts will be substantially greater. MOD have nevertheless been seeking additional ways in which the results of defence R & D can be put to wider use.

25 Following the informative discussion at an MOD seminar on defence spin-off in July 1982, which brought together industrialists, entrepreneurs, defence scientists and officials, MOD and DTI are considering jointly financing a study by management consultants into ways of enhancing

technology transfer to the civil sector. With the same objective, the two Departments are undertaking studies into the extent to which defence patents and technical reports can be made available to a wider audience. DTI is rewriting a number of MOD patents in the Tech Alert format so that they can reach a wide audience and generate enquiries from potential licensees. (Tech Alert is an information service operated by DTI, by which firms may find out about exploitable technical information produced by R & D in the public sector.)

26 In discussion with contractors, MOD always emphasises the advantages of investing in modern production equipment which may then be available for civil uses. Further encouragement for such investment would come from the acceptance of a Government proposal to the Review Board for Government contracts, for the introduction of incentive schemes whereby a contractor would share in the savings resulting from investment in improved methods of manufacture.

27 Some 70 per cent of expenditure on defence R & D is already extramural. The MOD is continuing to devolve design, development, project support and post design services to industry, wherever practicable and appropriate, on the lines recommended in the Strathcona Report, 1980 (MOD Defence Open Document 80/35 June 1980). The Government does not believe that complaints of over-classification of defence research are justified. The classifications attached to defence technology are kept to the minimum necessary to meet essential security requirements.

28 In addition to the MOD's internal review machinery, oversight of the overall Defence Research Programme is undertaken by the Defence Scientific Advisory Council and its constituent committees, whose members are drawn from universities, other research organisations and industry. Research in particular sectors of the R & D programme is overseen by joint MOD-industry Committees, such as the Joint Research Committee (Aircraft and Aero-engines) and the Joint Committee for Avionics and Systems Research. Detailed scrutiny of particular programmes is discharged by joint MOD-industry Research Consultative Committees, whose members have specialist knowledge in the relevant areas.

PRIVATE FUNDING FOR INNOVATION (Recommendations 6 - 11)

29 The Committee made several recommendations designed to stimulate the flow of private funds into R & D and the development of new technology generally. The Government fully supports this objective and through its general economic policies has sought to create the conditions in which such flows are encouraged. The Committee pointed out that high interest rates were a disincentive to risk investment in R & D; a key objective of the Government has been to reduce interest rates through restraints on public expenditure and other monetary measures. The resulting fall in interest rates, with the fall in inflation, has encouraged just the investment that the Committee wish to see.

30 The Committee's suggestion that some development expenditure could be funded separately from the main balance sheet of a company has previously been considered both by the Bank of England and the National Economic Development Council Committee on Finance for Industry, which is in the course of examining the idea against the background of specific projects which firms abandoned or deferred as a result of financial pressures. These studies have suggested that there are cases where a project with the prospect of a good commercial return may be deferred as a result of balance sheet constraints. On the basis of detailed discussion with companies, several specific projects have been identified which are now being examined with a small number of financial institutions to establish whether there is scope for separate funding of such ventures. There is already some experience of off-balance sheet funding of development expenditure. The National Research Development Corporation, now part of the British Technology Group, has for some time provided joint project finance, whereby it shares development costs incurred by a company in return for a levy on eventual sales of the product.

31 The Committee suggested that a development fund, offering tax incentives to investors, might be a desirable instrument for channelling private sector money into a range of high risk projects in existing industrial companies. The Business Expansion Scheme (previously known as

the Business Start-up Scheme) offers very generous tax relief to individuals for new, full-risk, equity investment in a wide range of established, unquoted trading companies with which they are not otherwise connected, as well as for equity investment in qualifying start-ups. Relief is available to individuals who invest in qualifying companies directly, or who invest through an approved investment fund acting as their nominee. Such funds give investors a spread of risk over a range of companies although the individual investor remains the beneficial owner of the shares. The success of the extended Scheme, and particularly its take-up in relation to R & D ventures, will be closely watched by the Government.

32 The Government notes the Committee's suggestion that Government financial assistance to industrial R & D should be selective rather than through general tax provisions. In practice, the Government's direct aid for R & D (through DTI schemes) is selective, but it is not feasible to apply this principle to taxation and tax allowances for R & D expenditure will continue to be non-selective. The Government intends to maintain the favourable fiscal regime for investment in R & D which it has established.

33 The Committee considered that a useful step in the creation of an environment favourable to R & D investment would be a requirement that companies should, in their annual reports, include a statement of their R & D expenditure, and recommended that the Department of Trade should discuss with the accountancy profession how to establish a requirement for this disclosure. Companies are, of course, quite free at the moment to disclose their R & D expenditure, as the Committee suggest, if they believe that it will enhance their reputation, and several companies already do this. The Government would certainly wish to encourage an investment climate in which such forward-looking expenditure was taken fully into account, but is not persuaded that a statutory requirement is the best way forward.

34 The last three years have seen significant changes in the legal framework governing company accounts. In particular, the Companies Act 1981 introduced a number of new reporting requirements as well as new

accounting formats and valuation rules as required by the Fourth Company Law Directive of the European Community. In formulating this legislation, the Government took the view that companies should be given the maximum flexibility to present information in a way most suited to their circumstances and that, given that the Fourth Directive required the introduction of a number of new disclosure requirements, further requirements such as that proposed would add unduly to the burdens imposed by the legislation on business. The Government sees no reason at present to change its basic approach.

35 The Government agrees with the Committee that efforts should be made to ensure that information about private sector sources of development finance should reach those who need it. The Bank of England have already given this considerable attention, through for example the publication of the booklet "Money for Business". This has been promoted through direct mailing to ensure that even the smallest firms have readily to hand a comprehensive guide to the methods and sources of funding available. A fourth edition is planned for publication in July. The Government does not therefore consider that a further initiative is warranted. DTI regularly participates in and helps to organise and promote seminars on sources of finance, from both private and public sectors, for R & D projects. These are organised by financial institutions, accountancy firms and bodies such as the Confederation of British Industry and are directed towards bankers, accountants, companies etc. DOI's Joint Appraisal Scheme is directed at bringing private sector finance into projects to supplement support available from Government sources and is being more intensively marketed.

MANAGEMENT (Recommendations 15 - 18, 33)

36 As the Select Committee pointed out, management issues must primarily be matters for individual firms. However, following the report of the Finniston enquiry Government facilitated the establishment of the Engineering Council. This should enhance the standing of professional engineers and consequently strengthen their position in the management of companies. The Government is pleased to note the Committee's welcome for the Council.

37 The Government agrees with the Committee's recommendation that small firms should be encouraged to appoint specialist non-executive directors to improve the performance of boards by bringing a fresh and wider view. Whenever suitable opportunities arise, small firms are encouraged to take such action, and to consult appropriate agency services to obtain advice on such appointments.

38 The Committee recommended that management should expose their young engineers more extensively to foreign expertise. SERC's Industrial Visiting Fellowship scheme is designed precisely to fill the need identified, and there is scope for expansion of this scheme in response to good applications. In addition DTI has recently set up its own Visiting Engineers Scheme to help with the costs of sending engineers to Japan.

39 Such schemes promote awareness of overseas technology. The Government agrees with the Committee that management should take full account of the possibilities for buying-in appropriate technology, especially from overseas. DOI already provides information to firms through the Overseas Technical Information Unit (OTIU) which receives reports from the network of Science Counsellors in major overseas posts. A pilot scheme has recently been introduced whereby British Council Science Officers (covering Brazil, Colombia, Denmark, Egypt, Finland, India, Italy,Mexico, Norway,Saudi Arabia,Spain, Sweden and Turkey) reinforce the network. Several commercial agencies can also help firms to find new products or new technology from overseas. The costs of licensing-in technology from overseas (provided that there will be a significant enhancement of it in the UK) are allowable in development projects under the "Support for Innovation" scheme.

EDUCATION AND INDUSTRY (Recommendations 18-25)

40 Various actions are in hand in response to the recommendations of the Finniston Committee (on the status and training of engineers, and changes in schools) which the Select Committee endorsed, and with which the Government is also broadly in agreement. In his statement on the

education and training of engineers in July 1981, the Secretary of State for Education and Science gave support to greater emphasis on engineering in schools.

41 The Government agrees that the needs of industry should be fully reflected in schools. In their policy statement "The School Curriculum" (March 1981) the Secretaries of State for Education and Science and for Wales made clear that it is a major function of schools to prepare children and young people for all aspects of adult life, and emphasised the importance of strong links between schools and industry; they also stressed the need for more attention to be paid to practical applications in the teaching of school subjects - a theme taken up again in the consultative paper "Science Education in Schools" (June 1982) and in the report of the Cockcroft Committee on the teaching of mathematics. More recently, the Government announced a technical and vocational education initiative which will enhance and develop courses in schools and colleges of further education related to engineering and technology. The Department of Education and Science (DES) provides direct financial assistance for the support of the National Liaison Officer for the Science and Technology Regional Organisations (SATROs) (see also paragraph 48), appointed by the Standing Conference on School Science and Technology. In certain cases DES provides financial support for the development of links between schools and industry.

42 The Committee may also know of the work of the DOI Industry/Education Unit, which exists to help young people learn about the importance of industry and commerce. The Unit encourages the introduction of new technology into schools and teacher training courses (the "Micros in Schools" scheme), the development of entrepreneurship in schools and collaboration with the Manpower Services Commission (MSC) (eg in the Information Technology Education Centres and the new technical education initiative). It also encourages industrialists to become more positively involved with the education system.

43 The Secretary of State for Education and Science has supported the enhancement of engineering degree courses by the inclusion of the

integrated study of engineering practice, and the continuing training of engineers. Some extended engineering courses are being introduced in universities, and a few selected polytechnics are also being invited to take part in a pilot scheme for extended courses in the public sector. In considering proposals for this pilot scheme, and for other new engineering courses in the public sector, the Government will place emphasis on the need for greater relevance to the needs of industry, in particular by the inclusion of engineering applications components, as recommended in the Finniston Report.

44 As regards the research links between HEIs and industry the Select Committee welcomed the study carried out by ACARD and the ABRC. The Government is now considering the recommendations made in that report. The Government, like the Committee, attaches importance to the promotion of close working relations between the engineering industry and science and engineering departments in all types of HEIs, including those outside the university sector. While much of the responsibility for promoting such links rests with individual firms and HEIs themselves, the Government recognises that it has a role in creating a suitable climate for such co-operation to occur.

45 There are already encouraging trends. The scope and volume of market-orientated R & D already undertaken by universities was highlighted in 1981 in a report by the Committee of Vice-Chancellors and Principals (CVCP) (Research in Universities, July 1980). The research undertaken by polytechnics is even more market orientated. The steady growth of the SERC's Co-operative Research Grants Schemes and Co-operative Awards in Science and Engineering, and of comparable schemes operated by other Research Councils, is bringing more industrial, market-orientated research into the university laboratory.

46. Both DTI and DES have supported a variety of initiatives designed to foster contacts between higher education and local industries. These include:

- Industrial Units at universities, which provide a consultancy service

for local industries and act as marketing agencies for academic skills.

- SATROs (Science and Technology Regional Organisations), which provide the forum for higher and further education institutions, schools, industry and commerce, and undertake a range of activities linking the interests of a local community.

- The Teaching Company Scheme, jointly funded by DOI and SERC, which aims to develop active partnerships between HEIs and manufacturing companies. These usually have a strong local interest.

- The DTI Microprocessor Applications Programme scheme which has a number of HEIs acting as consultants for industry and commerce.

- DTI award schemes, such as EPIC (Education in Partnership with Industry or Commerce) which aim to stimulate and reward successful co-operation between HEIs and companies.

47 The Committee expressed support for schemes, such as the SERC/DOI Teaching Company Scheme and sandwich courses, which bring young engineers and HEIs closer together. The Teaching Company Scheme is now expanding rapidly; the 100th programme was announced on 12 May by the Secretary of State for Industry. The success of early programmes in electrical and mechanical engineering has encouraged diversification into other manufacturing areas, including biotechnology and microelectronics. As for sandwich courses, Government shares the commitment of many HEIs and industry to this principle, and is concerned at the current shortfall of some 3,000-4,000 industrial placements for students. It is aware that many institutions would wish Government to provide financial assistance to companies who take students. Under the MSC's scheme of grants to employers in the fields of engineering, technology and computer science, financial support for 2,250 placements has been made available this year. The general question of industrial placements needs to be considered against the background of the costs and benefits of this type of education and prospect that the shortage of industrial places may be long term, particularly as there are competing claims for industrial training places. DES, in association with

DOI, the Department of Employment and the MSC, is financing a programme of research into sandwich courses to help to decide whether further provision might be justified.

48 Further initiatives to improve the links between higher education and industry include the `Young Engineer for Britain´ competition, which has been run by the DOI for the past seven years and is now to be administered by the Engineering Council. The competition aims to encourage the creative and entrepreneurial talents of young engineers in schools, colleges, polytechnics, universities and industry, and to provide them with an insight into the worlds of industrial and commercial application. Also, SERC is placing more emphasis on modular Advanced Courses and has initiated the Integrated Graduate Development scheme (which combines academic and industrial training for new graduates) and Industrial Postgraduate Studentships. In addition, the Council is supporting experiments in continuing education to improve the mid-career capability of engineering staff.

49 As for science parks, the Government agrees that, in appropriate circumstances, they can make a positive contribution and prove a valuable means of stimulating contact between HEIs and local firms. Currently, companies locating in a science park can and do take advantage of the assistance available under the DTI´s Support for Innovation schemes. The Government is examining what further efforts of various types might be made with the aim of improving the liaison between HEIs and industry.

50 The National Advisory Body for Local Authority Higher Education (NAB) has been considering how research might be fostered in the local authority sector of higher education; it has issued a discussion paper (The Funding of Research Activity, April 1983) proposing the selective distribution of an element of the Advanced Further Education pool to provide certain instituions with a basic level of funds for research activity. The Government will be considering advice in the Autumn from the NAB in the light of this consultative exercise.

51 The Committee considered that there was a need for more centres of high

technology resembling the Cranfield Institute of Technology and recommended that at least six HEIs should be specifically earmarked to support contract research. As will be clear from preceding comments, the Government endorses the importance of industry placing more research work in HEIs, with institutions responding fully to the needs of industry. However, it does not consider that the designation of specific centres would achieve the desired objective: it believes that excellence should be encouraged and supported wherever it is found. A wide range of institutions are capable of undertaking developments of high technological importance. Moreover, some of the recommendations in the ACARD/ABRC report on the links between HEIs and industry, if accepted, would have the effect of reinforcing success in contract research and go some way towards providing the concentration of resources that the Committee seeks.

52 The Government, like the Committee, is in favour of exchanges of staff between universities and industry. The Royal Society/ SERC Industrial Fellowship scheme is designed to promote such exchanges and the ACARD/ABRC report currently under consideration makes a number of detailed suggestions for ways in which mobility of staff between HEIs and industry may be increased. Government welcomes all attempts by institutions to create greater interaction by secondments and exchanges, different forms of employment contract, the employment of industrial staff on part-time appointments etc. The Committee referred to obstacles to mobility caused by superannuation arrangements; these apply more widely than simply in this area, and any solution would have to be similarly broad in its application. The Government is anxious to remedy this problem and has asked those concerned with occupational pension schemes to improve the arrangements for people who transfer from, or leave, employment before retirement.

INFORMATION AND ADVISORY SERVICES (Recommendations 30 and 31)

53 The Government agrees with the Committee that continuing efforts should be made to ensure the effective dissemination of R&D information. DOI's Manufacturing Advisory Service (MAS) has been complemented, since June 1982, by a Small Firms Technical Enquiry Service providing small firms of

fewer than 200 employees with up to 5 days' free consultancy advice. The recent Budget contained provision for an extra £20m to be spent over the next 3 years on MAS, on consultancy arranged through the Design Advisory Service and on the Small Firms Technical Enquiry Service (SFTES). The Government accepts that better publicity of schemes of assistance for small firms is needed. In March 1983, DOI launched a major publicity campaign with this in mind which has generated considerable interest. DOI have also agreed to a request from ACARD to provide a review of the current mechanisms for dissemination of research and development information so that the Council can, as requested by the Committee, consider the adequacy of existing arrangements.

R & D STATISTICS (Recommendation 34)

54 The Committee criticised the lack of up-to-date statistical information on industrial R & D expenditure and recommended an annual survey. While recognising the value of up-to-date statistics, this has to be set against the burden imposed on the firms from whom the information is sought. The Government has endeavoured to reduce such burdens and does not favour the addition of an annual R & D survey: moreover major firms have expressed considerable opposition to the proposal.

55 However, consideration is being given to the possibility of changing to a four-yearly benchmark survey supplemented by a less detailed survey at intervening mid-points. Industry has already been consulted on this proposal which would produce estimates of major R & D aggregates every two years. There are, though, limits on the speed with which the results of such surveys may be assembled. Respondents must be able to provide returns related to an accounting year, and this can end as late as 31 March following the year of the inquiry. The full accounts needed before the R & D questionnaire can be completed are often not available until six months after the accounting year ends.

CONCLUDING COMMENTS

56 This memorandum has shown that the Government and the Select Committee

share the same overall aim and that many of the measures proposed by the Committee are already incorporated in existing or proposed measures to stimulate and support engineering R & D. The Government has made clear its commitment to the development and application of new technology in all sections of the economy. It will maintain this commitment in the policies to be presented to the new Parliament. The Government would reiterate, though, that the principal incentive to investment in R & D is confidence in the underlying strength of the economy, and stability in market prospects. Since 1979, its policies have been designed to promote just such confidence, and an environment in which firms, responding to market forces, may make their own decisions on R & D and can finance such R & D out of normal business profits. The benefits of these policies are now beginning to show, and the Government looks forward to increasing investment in R & D by the private sector, which it will continue to reinforce through the measures outlined in this memorandum.

Mr Rickatt:
Over to you
TF
25/6.

Ref: A08803

Prime Minister:
To be aware of the timing.
TF
24/6.

MR. FLESHER

House of Lords Select Committee on Science and Technology

Thank you for your minute of 21st June about the response to the Select Committee's report. In the light of the Prime Minister's comments, the text of the Government's response to the Select Committee's report has now been revised. I attach a copy as it has been sent to the printer. We have consulted House of Lords officials about laying the White Paper. They have confirmed that it would be appropriate for it to be laid before Parliament by the Prime Minister: the Lord Privy Seal is content with this. Management and Personnel Office officials will be in touch with the Parliamentary Unit and the Press Office in No. 10 about the necessary arrangements. On present form, it is intended that the White Paper should be laid on Tuesday, 6th July.

2. I am sending copies of this minute and its attachment to the Private Secretaries to all the members of the Cabinet.

D.J. Wright

24th June 1982

COMMAND PAPER

GOVERNMENT RESPONSE TO THE REPORT BY THE SELECT COMMITTEE OF THE HOUSE OF LORDS ON SCIENCE AND TECHNOLOGY ENTITLED "SCIENCE AND GOVERNMENT"

The Government are grateful to the House of Lords Select Committee on Science and Technology for their valuable and stimulating review of the arrangements for scientific advice to government. In general, the Government fully accept the main thrust of the Select Committee's report; that the Government has a responsibility to secure an adequate scientific and technological input to policy-making. The Government concur with the Commmittee's outline of departments' need for advice (paragraph IV.2) and their view that what is needed is a strengthening of the centre rather than wholesale reorganisation (IV.6). As the Committee say, the machinery by which advice is to be tendered is less important than the ability, will and perseverance to seek and use such advice.

2. This response, like the Committee's report, covers the fields of science and research, and their relation to technology: but it does not cover the wider aspects of the Government's approach to technology.

3. Excellence in the development and exploitation of science and its applications is essential if the economic prosperity of the country is to be advanced in the coming decades, and if companies based on science and technology are to play their part in providing new employment opportunities. These objectives, which the Government regard as being of high priority, demand effective management of the limited resources (of both skills and cash) available, and mechanisms for ensuring that Government policies take full account of scientific opportunities and implications. The measures described in this paper are designed to aid their implementation.

Departmental Responsibility

4. The Select Committee believe that the integration of science and technology into policy departments is beneficial, and consider that there should not be a separate executive department responsible for all aspects of science and technology. The Government agree; it would be wrong to weaken the present responsibility of each Minister for securing the scientific advice he needs and for ensuring that his department commissions a suitable research programme. The changes set out below build upon this responsibility and on the customer - contractor principle for applied research*.

Chief Scientist, Central Policy Review Staff

5. The Committee recommend that a Government Chief Scientist should be appointed at Second Permanent Secretary level (IV.12). The Government accept the need for a senior scientist at the centre to fulfil the general role set out in paragraph IV.13 of the Select Committee's report. The post of Chief Scientist, Central Policy Review Staff was given an extended remit (the current job description is at Annex A) and was upgraded to Deputy Secretary when the present incumbent was appointed, not long before the Committee reported; its holder has, as the Committee recommended (IV.14) he should have, the right of direct access to the Prime Minister.

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* as described in the Rothschild Report, Cmnd 4814, 1971, accepted by the Government in Cmnd 5046, 1972, and reviewed in Cmmnd 7499, 1979.

6. The Government will await experience of the new arrangements before drawing a conclusion as to any further changes in the grading or title of the post. Meanwhile the Government accept the Committee's conclusions (IV.14) that the Chief Scientist, Central Policy Review Staff, will require a small unit to support him, and this will be established. The costs are within the totals given in paragraph 26.

Central Advisory Machinery on Applied Research

7. The Select Committee recommend (IV.15-IV.22) the establishment of a Council on Science and Technology (CST), with a remit that would cover the whole of scientific and technological endeavour and its implications for the policies and strategies of Departments and Government as a whole. However, the Committee consider that the Advisory Board for the Research Councils (ABRC) should be retained. The Government **accept** the need for high-level independent advice and for the retention of the ABRC, but **consider** that the improvement in the central advisory machinery should mainly be achieved by encouraging the Advisory Council for Applied Research and Development (ACARD) and ABRC to broaden their fields of study so that there is no gap in the coverage of the research spectrum.

Advisory Council for Applied Research and Technology (ACARD)

8. ACARD has recommended, in the light of the Select Committee's Report, that its own terms of reference should be revised and extended. They should enable it to cover the fields of applied research, design and development and the application of research and technology, together with the coordination of these activities with basic research. The Government **accept** ACARD's proposal, which goes a long way to meeting the Select Committee's recommendations, and have given it the following new terms of reference:-

"To advise the Government and publish reports as necessary on:-

- applied research, design and development in the United Kingdom;

- the application of research and technology, developed in the United Kingdom and elsewhere, for the benefit of both the public and private sectors in accordance with national economic needs;

- the coordination, in collaboration with the Advisory Board for Research Councils, of these activities, with research supported through the Department of Education and Science;

- the role of the United Kingdom in international collaboration in the fields of applied research, design and development related to technology".

Advisory Board for the Research Councils (ABRC)

9. The Government **agree** with the Committee (IV.23) that there should be no change in the ABRC's present role in the management of the Research Councils and in advice to the Department of Education and Science on that part of civil science supported by the Science Budget. The Government take **note** of the other points made by the Committee about ABRC (IV.23-24). In future, a member of the Secretariat of ABRC will be contributed by the Cabinet Office Unit which services ACARD, and a DES official will join the

ACARD secretariat. Joint secretariats of this sort should help to ensure coordination between basic and applied science, and between the two advisory bodies, without disturbing the present distribution of responsibilities.

An Annual Report for Science

10. The Committee proposed that their Council for Science and Technology would submit an annual "state of the nation" report (IV.16). The Government **agree** that such a periodic report would be valuable (though not necessarily as frequently as once a year) and will ask the Chairmen of ACARD and ABRC to present joint reports to the Government. These would, as the Committee recommend, review scientific opportunities and their implications, on a selective basis, as well as reporting on the Annual Review of Research described below. They will not necessarily be confined to activity in the public sector.

Departmental Chief Scientists

11. The Government **accept** the views of the Committee that Departmental Chief Scientists should have a wide-ranging role in Departmental policy making, and should not be too involved in detailed research management, (IV.26). **They consider** however that Departments are in fact making satisfactory provision for scientific advice, though arrangements will continue to evolve to meet changing needs. The Government **do not accept** the Committee's suggestion (IV.25) that the power and influence of Departmental Chief Scientists have declined, nor that all these posts have to be graded at Deputy Secretary level or above. The grading used must reflect the responsibilities allocated to the post and the needs of the Department. A Departmental Chief Scientist may be afforded the necessary access to top management and Ministers even though serving in a grade lower than that of Deputy Secretary. The Government's views on the particular arrangements noted by the Committee are set out below.

HM Treasury

12. The Select Committee noted (IV.36) the Treasury's need for access to expertise on science and technology in its scrutiny of departmental Estimates. The Government **doubt** whether a single Chief Scientist could advise over the whole range of spending programmes; in any case, decisions on priorities within PES blocks are largely for Departmental Ministers. However, the Chief Scientist, Central Policy Review Staff, will be available to advise the Treasury when required. Paragraphs 19-21 describe a procedure for Annual Reviews of Research which should meet the need to address the important questions with which the Select Committee thought a Chief Scientist in the Treasury would be concerned.

Department of Education and Science

13. The Committee suggested (IV.23) that the Chairman of ABRC should be invited to perform some of the functions of a Chief Scientist for DES. However, there are existing arrangements for the provision of advice on science teaching at all levels, by HM Inspectorate of Schools in relation to schools and maintained and voluntary further and higher education and by the University Grants Committee in respect of the Universities. The DES commissions only a limited amount of educational research. The arrangement proposed by the Committee would detract from the independence of the Chairman of ABRC.

The Scottish Office

14. The Government have, as recommended by the Committee (IV.2[illegible], considered the Royal Society of Edinburgh's proposal for a Chief Scientist in the Scottish Office and **conclude** that the aims of this recommendation can be better achieved by other means. It is impracticable to require a single Scientist to deal authoritatively with the whole range of scientific advice which is needed by the five separate Departments within the Scottish Office and to maintain the necessary close contacts with the policy makers in all the diverse areas of work to be covered; it would be difficult, if not impossible to recruit an appropriate person for such a job. There is, of course, a Chief Scientist in the Home and Health Department. However, Scottish Departments will require scientific advice beyond that available in-house. Experience has shown that expert advice is readily available from appropriate committees. In such a way, better and more selective use of expertise may be made than could be achieved from formal links to corporate bodies or societies. Nevertheless, there is no reason why bodies such as the Royal Society of Edinburgh cannot, on their own initiative, identify appropriate departmental interests and approach the Scottish Office directly.

Ministry of Agriculture Fisheries and Food

15. The changes in the arrangements for scientific advice in MAFF to which the Committee refer (IV.29) have been in effect for slightly less than a year. Already, however, it is evident that they are working well. The two Chief Scientists, in close cooperation with their Deputy Secretaries and their scientific staff, have improved the coordination of the Ministry's research programmes with its policy interests and have contributed to the increasingly close relationship of the Ministry with the Agricultural Research Council. The new arrangements allow scientific advice to be much more closely integrated into the process of decision making. The Government **conclude** that these arrangements should be allowed to stand.

R&D Funding: Mechanisms and Principles

16. The Committee are concerned tha there is too rigid a distinction between basic and applied research, and that certain areas of research are being neglected. The Government **note** this concern and will ask ACARD and ABRC to review the links between basic and applied research and, in particular, to look at the arrangements for long-term but directed research - often known as "general research"* or, as termed in paragraph IV.30 of the Committee's report, "strategic research".

Inter-Departmental Coordination

17. The Committee consider that more constructive use of the general machinery for interdepartmental coordination is required (IV 34-35), and that there is a place for a forum at a level below that of the current Committee of Permanent Secretaries and Chief Scientists. The Government **accept** this proposal and are establishing a Committee of Departmental Chief Scientists, chaired by the Chief Scientist, Central Policy Review Staff. This group will be concerned with the overall framework of science within government, and particularly with coordination of research programmes; arrangements will be made for DES and the Research Councils to be represented.

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* The Rothschild Report, Cmnd 4814, 1971

External Communication

23. The Select Committee were concerned (IV.48) at evidence which described as inadequate the current channels of communication between Government and the scientific and technological community. They recommend a review of relationships with outside bodies. The Government **accept** the importance of keeping these channels of communication open and effective. Indeed, the Government is probably more reliant on external advice in relation to science and technology than in relation to almost any other area. The Government **do not consider** that new formal machinery to articulate the formation of this advice is required, but will always consider carefully advice from scientific societies and engineering institutions as to issues which require further study. It is the Government's general policy to keep the structure of advisory bodies under regular review and to wind them up once their usefull lifetime has expired. Such reviews will not overlook the wider benefit, in terms of understanding of Government, that membership of such bodies can bring.

24. The Committee also express concern (IV.50) - repeated in the subsequent debate in the House of Lords - over the lack of feedback to those who have given advice. The Government **agree** that members of advisory committees and similar bodies should always receive some indication of the outcome of their advice, particularly if it cannot be accepted.

25. The Committee also comment (IV.51-53) on the need to improve relations with the engineering profession, especially in the light of the establishment of the new Engineering Council (on which the Committee will no doubt have more to say in its further report on Engineering Research and Development); and on the need to improve the machinery for receipt and dissemination of scientific information from abroad. The Government **note** these points; international links will be a particular concern of the Chief Scientist, Central Policy Review Staff, in his strengthened role.

Costs

26. As the Committee say (IV.55), there will be some cost in establishing these improved arrangements for central coordination of science and technology. The Government estimate that around 6 new senior posts are required, which will cost about £1/4 million. These new posts will in the main be concerned with support to the Chief Scientist, Central Policy Review Staff, in the improved review and coordination roles described in this Paper, and in servicing ACARD and ABRC. The Government believe that the benefits of improved decision-making will more than justify this cost, which will be contained within the overall resources available for science & technology in Government.

A Central Minister for Science

27. The Committee **recommend** (IV.11) that a Cabinet Minister should be designated to speak for Science and Technology, in addition to other responsibilities. But, as they note (II.13), the Prime Minister has herself said, in a Written Answer (HC Deb. 29 Oct 1979 cc411-12) "Issues may arise which straddle the responsibility of several Ministers to such an extent that it would not be sensible to ask one of them to take the lead. In such a case I would myself play a coordinating role. I would also, where this was appropriate, answer questions in the House on broad scientific and technological issues involving several Departments".

18. The Committee recommended (IV.37-38) enhanced coordination between civil and defence research programmes, and further efforts to ensure that inventions developed by defence research are exploited for the benefit of the economy. The Government **accept** the need for improved coordination and to achieve this, the Chief Scientist, Central Policy Review Staff, and the Chief Engineer and Scientist, Department of Industry, will join the Defence Scientific Advisory Council as the Committee recommends (IV.38), and also the Defence Research and Intramural Resources Committee. At a lower level, Department of Industry and other civil departments are invited to join in the MOD's reviews of the programmes of their research establishments. Ministry of Defence officials are already involved with the appropriate Department of Industry Research Requirements Boards and will continue to be drawn into other departments' research-commissioning arrangements.

Annual Reviews of Research

19. A central theme of the Select Committee's recommendations (see, for instance, paragraph IV.36) was the need for more effective review of the broad deployment of effort in science and technology. In a financial context, the problem is a familiar one: how to take a horizontal look at particular types of public expenditure when the main control processes operate vertically by slicing expenditure into individual departmental programmes. At present, there is no overall review of Government R&D plans in the Public Expenditure Survey (PES) cycle. This is a significant contrast to typical private sector practice where research plans produced by operating divisions and by the R&D department are reviewed independently at Board level.

20. The Government have therefore **decided** to introduce a system of Annual Reviews of Research. Departments will submit a summary of their research programmes and budgets, to be reviewed inter-departmentally, with independent advice from ACARD, during the early months of the year; this timetable would allow Departments to revise their plans during the next PES cycle in the light of the results of the Review.

21. The analysis required will not be a facile choice of areas where more money should be spent. In the Government's view, overall UK expenditure on research and development as a percentage of GDP is sufficient. Skilful value judgements as to allocation of financial and manpower resources are, however, needed. This will involve distinguishing between vital and dormant areas, identifying gaps, disparities and duplications, and considering the opportunity cost of relinquishing certain areas of research. The emphasis will be on review of long-term plans.

Civil Service Issues

22. The Select Committee emphasise, in paragraph IV.39-IV.42, the need for changes in attitudes to science and technology in the Civil Service and more generally. They endorse the technological generalist scheme described in the Report of the Holdgate Committee* and call for a greater flow of scientists and others in and out of the Civil Service. The Government **note** the general points made and will follow them up in implementing the Holdgate recommendations which are being carried forward by departments in collaboration with the Management and Personnel Office (MPO)≠. The MPO will monitor progress on the technological generalist scheme and other recommendations against objectives agreed with departments, and will report to Ministers. Continuing efforts will be made to ensure that secondment and interchange arrangements succeed, and that staff are clear that such wider experience will be of real benefit to their careers.

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≠ The Government Response to Cmnd 8032, CSD 1981.

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24. The Committee also express concern (IV.50) - repeated in the subsequent debate in the House of Lords - over the lack of feedback to those who have given advice. The Government **agree** that members of advisory committees and similar bodies should always receive some indication of the outcome of their advice, particularly if it cannot be accepted.

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26. As the Committee say (IV.55), there will be some cost in establishing these improved arrangements for central coordination of science and technology. The Government estimate that around 6 new senior posts are required, which will cost about £1/4 million. These new posts will in the main be concerned with support to the Chief Scientist, Central Policy Review Staff, in the improved review and coordination roles described in this Paper, and in servicing ACARD and ABRC. The Government believe that the benefits of improved decision-making will more than justify this cost, which will be contained within the overall resources available for science & technology in Government.

A Central Minister for Science

27. The Committee **recommend** (IV.11) that a Cabinet Minister should be designated to speak for Science and Technology, in addition to other responsibilities. But, as they note (II.13), the Prime Minister has herself said, in a Written Answer (HC Deb. 29 Oct 1979 cc411-12) "Issues may arise which straddle the responsibility of several Ministers to such an extent that it would not be sensible to ask one of them to take the lead. In such a case I would myself play a coordinating role. I would also, where this was appropriate, answer questions in the House on broad scientific and technological issues involving several Departments".

The Government believe that the stronger machinery at official level outlined above, together with this role of the Prime Minister, means that scientific or technological issues are unlikely to be lost or forgotten. They do not believe that there is - within the British system of Cabinet Government - at present an identifiable and viable role for a coordinating Minister, and accordingly, **do not agree** with the Committee's recommendation.

28. The Government are confident that the revised arrangements set out in this response will lead to more effective articulation of the UK's very considerable efforts in science and research, at all levels from basic research to product development, with other activities of government. They are in no doubt of the importance of science and technology in assuring the well-being of the people of the United Kingdom.

27 April 1982

THE REMIT OF THE CHIEF SCIENTIST, CENTRAL POLICY REVIEW STAFF

The Chief Scientist provides scientific and engineering advice for the CPRS and the Cabinet Office generally. He sits on the principal Committees which deal with the scientific and technological issues that come before Government except for those which are solely the concern of a single department. He is the Government's scientific representative on many international occasions.

A.2 **Cabinet Office.** The Prime Minister and the Secretary of the Cabinet looks to the Chief Scientist, Central Policy Review Staff, to provide, or organise the provision of, advice on scientific and technological matters, or scientific and technological aspects of other issues, which come to the Cabinet Office.

A.3 **CPRS.** The Chief Scientist, Central Policy Review Staff, is a member of CPRS and is responsible for providing scientific and technological input to CPRS studies. However, he is not constrained by title and has the opportunity to contribute to issues which are not overtly scientific or technological.

A.4 **Government Committees.** The Chief Scientist, Central Policy Review Staff, is ex officio a member/assessor of the Advisory Council for Applied Research and Development (ACARD), the Advisory Board for the Research Councils (ABRC), and is also a member of the Committee of Chief Scientists and Permanent Secretaries. The Chief Scientist is the prime link between ACARD and the Government and plays a central role in planning ACARD's work.

A.5 **International Affairs.** The Chief Scientist, Central Policy Review Staff, has a general responsibility for coordination of international scientific and technological relationships, covering in particular:

a. The UK's bilateral scientific and technological agreements with other countries.

b. The European Community R&D Budget. The Chief Scientist is UK membre titulaire on CREST (the Committee that advises both the Council of Ministers and the Commission).

c. The Chief Scientist is often asked to attend (or accompany Ministers attending) general fora on scientific and technological topics organised by bodies such as the OECD, UNESCO, etc.

d. The research plans and budgets of other international organisations.

Finance Committee Hansard → last Thursday. 973 clause 119

File SW Parliament

10 DOWNING STREET

cc DES

From the Private Secretary

MR. WRIGHT
Cabinet Office

House of Lords Select Committee: Report of the Official Committee on Science and Technology (STO)

The Prime Minister has seen Sir Robert Armstrong's minute (Ref: A08687) about the response to the Select Committee's Report and is content that there should be no reference to a trial period for the system of reviews and research in the published report on the understanding that she will have an opportunity to review progress at the end of the trial period.

TIM FLESHER

21 June, 1982

Prime Minister:

Content with Sir Robert Armstrong's suggestion on the form undertaking as a report to you after a year?

Yes pse TF 16/6.

Ref. A08687

MR. RICKETT

House of Lords Select Committee: Report of the Official Committee on Science and Technology (STO)

Thank you for your minute of 11th June, recording the discussion which Dr. Nicholson and I had with the Prime Minister that morning.

2. We are amending the draft response to the Select Committee to take account of the Prime Minister's decisions.

3. On the point in paragraph three (a) of your minute, I would take the Prime Minister's decision that the system of reviews of research should be established for an initial trial period as essentially a matter of internal self-discipline, rather than as something to be included in the published report. If we say in the report that the system is being established for a trial period, that will invite another raft of questions and suggestions for further changes.

4. I therefore propose that there should be no reference to a trial period in the published report; but we will of course be reporting to the Prime Minister on the initial experience of the system of reviews of research at the end of the trial period, so that she can then take a decision whether to confirm the system or make further changes.

A new incumbency: C

pse.

RA

ROBERT ARMSTRONG

16th June, 1982

EA

RESTRICTED

NBPM

DF
16/6

SECRETARY OF STATE FOR THE ENVIRONMENT

The Prime Minister

HOUSE OF LORDS SELECT COMMITTEE REPORT: SCIENCE AND GOVERNMENT

I have read Sir Robert Armstrong's minute to you of 21 May on this subject and looked through the papers he enclosed with it.

The question of Ministerial responsibility is obviously yours, especially since you have yourself been keeping an eye on the adequacy of the overall Government approach in scientific and technical matters. I would only add that I am myself not convinced from the papers that there is much real reward to be gained from having a co-ordinating Minister flanking you in an area like Science and Technology which really ought to be very much built into the policies we all pursue in our departments. I am certainly not aware of any major problems with which I am confronted here because of the lack of another colleague with this remit.

I am also inclined to agree with Sir Robert that we would do better to give ACARD, which seems to me to be a fairly successful body, new terms of reference and a remit to co-operate more positively with the ABRC, rather than set up a new Council on Science and Technology with all the fuss that that might generate. Likewise, since we now have in the presence of Dr Nicholson a Chief Scientist at Deputy Secretary level in the Cabinet Office, I wonder very much about the need for appointing a more senior official over his head. I am advised by my own Chief Scientist that Dr Nicholson has already taken a most useful lead in meeting regularly with his senior colleagues in the different departments and I would have thought that there was much to be said for letting him continue to develop his role in this way.

RESTRICTED

SECRETARY OF STATE FOR THE ENVIRONMENT

My overall feeling is therefore that the approach proposed by Sir Robert - which is essentially low key and involving building on the machinery we have rather than attempting a radical reconstruction is right. I am copying this minute to all members of the Cabinet and to Sir Robert Armstrong.

M H

15 JUN 82

SUBJECT

10 DOWNING STREET

From the Private Secretary

MR. WRIGHT
Cabinet Office

House of Lords Select Committee: Report of the Official Committee on Science and Technology (STO)

The Prime Minister had a word with Dr. Nicholson at 1230 today about Sir Robert's minute to her of 21 May, reference AO8481.

The Prime Minister explained that she was content that Ministerial responsibilities for scientific and technological issues should remain unchanged, but she was concerned about the recommendations for improving coordination at official level set out in paragraph 5 of Sir Robert's minute. Her concern was that these recommendations would create extra work and extra bureaucracy, at extra expense, and that this expense would not be justified by any savings achieved through better coordination.

After some discussion, the Prime Minister agreed the recommendations in sub-paragraphs (a), (b), (c) and (e) of paragraph 5 of Sir Robert's minute, but with the following qualifications:

(a) the system of Reviews of Research, recommended in sub-para (a), and the Committee of Chief Scientists, recommended in sub-para (e), would only be established for an initial one year. She would take a decision on whether or not to extend their existence in the light of a report on what had been achieved in that initial year. In particular, she would be looking for evidence that the work done on the Review of Research, and the activities of the Committee of Chief Scientists, had been cost-effective;

(b) that the Chairman of the ABRC and ACARD should not be asked to report on science and technology more than once a year, and preferably not more than once every two years.

/The

The Prime Minister was not willing to agree that Dr. Nicholson's post should bear the title of Chief Scientist, Cabinet Office.

You will now wish to amend the Government's draft response to the Select Committee's Report to take account of the Prime Minister's decisions. I should be grateful if you could let us know when you intend to publish it.

I am copying this minute to Private Secretaries to all members of the Cabinet.

W. F. S. RICKETT

11 June, 1982

JU329

For meeting folder for 11 June

DEPARTMENT OF INDUSTRY
ASHDOWN HOUSE
123 VICTORIA STREET
LONDON SW1E 6RB
TELEPHONE DIRECT LINE 01-212 3301
SWITCHBOARD 01-212 7676

Secretary of State for Industry

3 June 1982

Sir Robert Armstrong KCB CVO
Cabinet Office
70 Whitehall
London SW1A 2AS

Dear Robert,

Thank you for sending me a copy of your minute of 21 May to the Prime Minister with the report of the Official Committee on Science and Technology (STO) and the draft White Paper responding to the report "Science and Government".

2 I am strongly in favour of Model 1 in the STO Report which I believe is the only model fully consistent with the responsibilities of Ministers for the integration of science and technology policy with the general policy of their Departments. I am therefore content with the draft White Paper which embodies this model and I believe that the arrangements proposed, at both Ministerial and Official level and set out in the White Paper, will provide us with an effective system of scientific advice and management in Government.

3 I am sending copies of this letter to the Prime Minister and to all members of the Cabinet.

Yours ever

Patrick

10 DOWNING STREET

From the Private Secretary

Fixed for 11 June.

MR. WRIGHT

HOUSE OF LORDS SELECT COMMITTEE REPORT: SCIENCE AND GOVERNMENT
REPORT OF THE OFFICIAL COMMITTEE ON SCIENCE AND TECHNOLOGY (STO)

The Prime Minister has seen Sir Robert Armstrong's minute of 21 May, reference A08481. As I have told you on the telephone, the Prime Minister is not entirely happy with the recommendations made by STO for improving the coordination of scientific and technological issues at official level, summarised at paragraph 5 of Sir Robert's minute. She feels that some of these recommendations will simply create extra work without extra efficiency, particularly the recommendations at paragraphs 5(c) and 5(e). She was also surprised by the implication in paragraph 5 (a) that there was not already a system for the annual review of research. She also doubts whether it would help to designate the Chief Scientist in the CPRS as "Chief Scientist, Cabinet Office".

The Prime Minister would like to discuss STO's report, and the draft response to the House of Lords Select Committee's report, with Sir Robert Armstrong. She would like in particular to be given a clearer picture of what work is already done on the coordination of scientific and technological issues. Caroline Stephens here will be in touch to fix a meeting. As you suggested, it would probably be helpful if Dr. Nicholson were to accompany Sir Robert.

I am not copying this minute elsewhere.

W. F. S. RICKETT

24 May 1982

Prime Minister

Sir Robert Armstrong seeks your agreement to publish the draft White Paper at A. It is a response to the House of Lords Select Committee Report. Its main conclusion is that ministerial responsibilities for the coordination of science and technology should remain unchanged. But it does make suggestions for improvement at official level. These are summarised at B (below). Agree Sir Robert's recommendation?

Ref. A08481

PRIME MINISTER

House of Lords Select Committee Report: Science and Government
Report of the Official Committee on Science and Technology (STO)

CSR 21/5

I attach a report by the Official Committee on Science and Technology which examines the form of the Government's response to the House of Lords Select Committee on Science and Technology, which reported on "Science and Government" in December 1981.

2. The Official Committee makes a number of agreed recommendations for strengthening the official interdepartmental co-ordinating machinery for science and technology, some of which I discuss below. We also analysed, but did not reach conclusions on, the Ministerial arrangements for oversight of science and technology.

3. The Select Committee recommend (IV.11) that a Cabinet Minister should be designated to speak for science and technology (in addition to other responsibilities), though they note that you yourself announced in October 1979 that you would yourself play a co-ordinating role, and answer questions in the House, on broad scientific and technological issues. In our report, we identify a progression of four models for Ministerial responsibility, in addition to the strengthening of the official infrastructure:

Model 1: Ministerial responsibilities unchanged.

Model 2: Basic science remains at DES; a non-executive, non-departmental, Cabinet Minister reviews and co-ordinates Departmental research programmes (on a part-time basis).

Model 3: A Minister of State at DES takes on a co-ordinating role, in addition to his executive responsibility for basic science (with the Secretary of State for Education and Science speaking in Cabinet).

Model 4: A non-departmental Cabinet Minister takes on executive responsibility for the Science Vote as well as the co-ordinating role (again on a part-time basis).

4. On balance the Official Committee thought that the case for a change in Ministerial arrangements had not been made out, and was not satisfied that there was a worthwhile role for a Minister on the lines recommended by the Committee. It was therefore in favour of Model 1. If presentational considerations led you to conclude that it was necessary to accept the Select Committee's conclusions that a Minister should be appointed, then Model 2 would be a workable alternative. On the other hand, experience with appointments or co-ordinating Ministers for a wide range of questions have generally indicated that such remits have not been found to be useful or satisfying by the Ministers concerned.

5. The other recommendations which I draw particularly to your attention are:

(a) The establishment of a system of Annual Reviews of Research (Report, 5.3 and 5.4).

(b) Acceptance of ACARD's recommendation that it should have new terms of reference, which put emphasis on the application of research and technology in the United Kingdom, wherever the basic discovery comes from (8.5).

(c) That we should commission a periodic report on Science and Technology by the Chairmen of ABRC and ACARD (8.6).

(d) That the Select Committee's main point regarding the remit of a Government Chief Scientist has already been met in Dr Nicholson's appointment, but that he could, with advantage, bear the title of Chief Scientist, Cabinet Office (9.3).

(e) That a Committee of Chief Scientists be established under his Chairmanship with the particular responsiblity of co-ordinating Departmental acitivities in Science and Technology (7.1).

6. Annexed to the report is a draft response to the Select Committee, in the form of a White Paper. This is drafted on the basis that you decide to make no changes in relation to Ministerial responsibility; obviously it will need a certain amount of adjustment if a co-ordinating Minister is appointed. The White Paper is also drafted on the basis that you would wish to make a positive general

response to the Select Committee by re-stating the Government's acceptance of the importance of Science and Technology to the country's future economic performance (paragraph 3).

7. Subject to your decision on the question of Ministerial responsibility, I recommend that the remaining conclusions of the Official Committee should be accepted, and that the Government should publish a response along the lines of the attached draft.

8. The Government has said that it will aim to reply to Select Committees within six months of their report: this period expires on 9 June. In a Written Answer (16 March 1982, to Mrs Renee Short) you said that the Government hoped to publish their response in June: Lady Young has made similar commitments. Accordingly, we should aim to send the White Paper to the printers within a fortnight or so, and to send typescript advance copies to the Select Committee.

9. I have discussed the STO report and the draft reply with the Lord Privy Seal, who has authorised me to say that she is generally content with what is proposed, and with the draft reply. She would like to take part in any Ministerial discussion of the matter.

10. I am sending copies of this minute to all members of the Cabinet.

RA

ROBERT ARMSTRONG

21 May 1982

Some of the recommendations under B (previous page) will just make extra work without extra efficiency - particularly (c) + (d). May we have a word about whether already done

Science and Government : Report by STO

Annexes

SCIENCE AND GOVERNMENT

Report by the Committee of Chief Scientists and Permanent Secretaries (STO)

1. INTRODUCTION

The House of Lords Select Committee on Science and Technology report on "Science and Government" (HL 20-I) was published on 9 December 1981. The report makes comprehensive recommendations covering, in particular, central arrangements, departmental structure, and the Civil Service. A summary of the Report is at Annex A. The Government has announced that it will respond by June. We have been asked asked to advise Ministers on a draft Government response and recommendations for action. We now submit our report, to which a draft response is attached (at Annex E). Because terminology is so important, we have tried to define some essential terms: these are at Annex B together with a bibliography.

2. SCOPE OF THE HOUSE OF LORDS REPORT

The main thrust of the Select Committee's report concerns the Government's responsibility to secure an adequate scientific and technological input to policy-making. Such an input has to cover a wide spectrum. At one end lie the pure science disciplines and, at the other, application and development. However the Committee heard from only one major industrial concern. Their attention in taking evidence was thus directed towards science, and although their report refers to both science and technology, they did not widen their scope as much as this might imply. We have taken this omission into account, and have concentrated similarly on science and research and their relation to technology.

3. HISTORICAL PERSPECTIVE

3.1 Following the Haldane report on the organisation of Government (1918) the Lord President (and later the Lord Privy Seal) took responsibility for the Research Councils and the Department of Scientific and Industrial Research (DSIR), thus centralising responsibility for science. Then from 1961 to 1964 there was a Minister for Science, Lord Hailsham who, with a small staff, took over these functions together with sponsorship of the United Kingdom Atomic Energy Authority. In 1962 a committee under Lord Trend recommended changes of organisation for basic and applied science. Its recommendations on the Research Councils were put into effect by the Science and Technology Act 1965, but other proposals were modified. On basic science, the Council for Scientific Policy was set up under DES which thus extended its responsibilities to cover science; on applied science, the Advisory Council for Science and Technology (ACST) was set up under the new Ministry of Technology which also took over the applied research establishments from DSIR.

3.2 With the demise of the Ministry of Technology in 1970 ACST disappeared and the organisation of applied science (together with relevant research establishments) devolved on user departments. The decentralisation was accelerated and strengthened as a result of the Rothschild Report of 1971 (Cmnd 4814) on which the Government acted in 1972 (Cmnd 5046). The Lord Privy Seal still retained some responsibility for applied science and was the titular chairman of the Advisory Council for Applied Research and Development (ACARD) when that was set up in 1976; but his responsibilities were

terminated in 1979. In the period since 1974, the position of Government Chief Scientific Adviser was first abolished and then replaced initially by a Chief Scientist CPRS (at U/S level) and then by a Chief Scientist with responsibilities in both the CPRS and Cabinet Office (at D/S level).

3.3 In 1979 the Prime Minister said, in a Written Answer (HC Deb. 29 Oct 1979 cc411-12): "Issues may arise which straddle the responsibility of several Ministers to such an extent that it would not be sensible to ask one of them to take the lead. In such a case I would myself play a coordinating role. I would also, where this was appropriate, answer questions in the House on broad scientific and technological issues involving several Departments."

4. THE STRUCTURE OF GOVERNMENT-FUNDED RESEARCH

Reasons for research

4.1 Departments support research for a variety of reasons. In some cases the work meets a need within departments such as providing information for Government policy-making, including regulatory work and standards making, or support for the purchasing programmes or official services. In others, departments are proxy customers for others (eg local authorities, farmers or certain industrial sectors) who are not able to do their own research and development or, in the opinion of Government, do it inadequately. In these cases, promoting the results of the research may be as important as the research itself.

Basic Research

4.2 Most basic civil science is done in universities and Research Council laboratories. Public financial support for University research is organised in a system of dual funding. One stream of funding flows from the DES Science Budget through grants-in-aid to the five Research Councils which, in addition to running their own institutes and laboratories, give selective support for research and postgraduate training in universities and provide (in Council establishments or through international research bodies) certain central facilities which university researchers use. The other stream flows from the University Grants Committee (UGC) to the individual universities, who generate their own facilities and programmes for fundamental scientific research and provide 'well-found' laboratories for Research Council-supported projects. In both cases, this research is generally aimed at the advancement of knowledge and longer-term objectives rather than at specific applications in the short-term. The aim is to fund it at a level that ensures maintenance of the capacity for basic research, and yields the necessary starting points for applied research, as well as providing trained manpower. The present difficulties in the operation of the dual funding system have been studied by a working party from the Advisory Board for the Research Councils (ABRC) and the UGC; their report is now being considered.

Applied Research

4.3 On the other hand, Government purchase of commissioned research is governed by the customer-contractor principle described by Rothschild. Government departments, as customers, define their requirements, contractors advise on the feasibility of meeting them, and undertake the work. Both Government departments and non-departmental public bodies (including Research Councils and Universities) carry out commissioned research with departmental funds: though some of what is referred to as research is tapping existing knowledge outside Government and is more akin to technology acquisition. Departments also keep in touch with research programmes in the Nationalised Industries. However, there is little coordination or central review of the volume and shape of programmes across departments.

General Research

4.4 The Select Committee suggests (Report IV.31), and **we agree**, that there is a danger that a gap is developing in long-term but directed research, where these two types of research should meet. This is the area known as general (also known as strategic, generic or underlying) research. Rothschild tried to counter this danger when he proposed that contractors would be able to contribute more effectively to their applied research projects if they had some freedom to undertake work which, while being financed by the customer, was not immediately related to a specific programme of work. He proposed a general research surcharge - an average, in money terms, of 10% of a customer's programme - towards this end. The Government accepted this in principle but, at least in the defence field, where it fell to around 3.5% in the late seventies and now runs at about 6%, general research has been well below this level. In other areas the general research surcharge has been omitted entirely or it has been assumed that general research is synonymous with the basic research funded by DES - a principle specifically excluded by Rothschild. General research is not, however, confined to research funded as a surcharge on customer programmes; it can be directly funded by contract in appropriate cases. We **recommend** that ACARD and ABRC should be asked to review this subject.

5. MAKING POLICY FOR RESEARCH

5.1 Central to the Select Committee's recommendations was a concern that Ministers should be able to review more effectively the broad deployment of effort in science and technology, and where necessary bring it more into line with national interests. **We agree** that there is a general problem of developing an overview of the customer-funded work and articulating it with the work supported by Research Councils and Universities. In terms of finance, the problem is a familiar one: how to take a 'horizontal' look at particular types of public expenditure when the main control process operates 'vertically', slicing it into individual departmental programmes, many of them block budgets. At one time, tables appended to the PES Report gave such an analysis of science expenditure, but these were dropped through lack of interest. At present, there is no overall review of government R&D plans in the PES cycle. This is at significant variance to typical private sector practice, where research plans produced by operating divisions and the R&D department are reviewed independently at Board level.

5.2 The Select Committee (IV.16-17) drew attention to the need for a coordinated watching brief to be kept to build up, from the scattered sources of information, an integrated picture of what is being done in science and technology. This accords with their concern that in a very budget-minded system, subjects which are nobody's prime remit may come off the poorer in many separate instances, none disastrous by themselves but giving a serious adverse effect overall.

5.3 The Select Committee recommend a review of the balance, compatibility and thrusts of Departmental R & D plans and imply that this should be undertaken by Treasury (paragraph IV 36). We think that Treasury involvement rather than a Treasury lead is more appropriate but **we recommend** the introduction of a system of Annual Reviews of Research. Departments would prepare a summary of their R & D objectives and plans, to be reviewed by the Committee of Chief Scientists (which we **recommend** in paragraph 7.1 below) with independent advice from ACARD. While information on Research Councils' plans needs to be available, the Reviews should be organised so as fully to allow for the role of the ABRC as advisers to the Secretary of State for Education and Science.

5.4 The analysis required is not a facile choice of areas where more money should be spent; probably overall UK expenditure on R&D as a percentage of GDP is no less than it should be. Skilful value judgments as to allocation of financial and manpower resources are needed - a distinction between vital and dormant areas; identification of gaps and disparities, and of duplications; consideration of the opportunity cost of relinquishing certain efforts. The review should operate with fairly long time horizons, and should avoid intervention in short term plans of Departments.

5.5 It is important to both the well-being of science and technology and the economy generally to get the policy-making machinery right. Only if the economy prospers can particular facets of science and technology be expected to prosper. Contrariwise the country needs to develop excellence in applied science and technology, as the key to economic upturn; our perceived strengths at the moment lie far more in the field of basic research. UK industries, having survived a painful slimming down, are now in a position to move ahead and exploit new technologies - from either civil or defence sources. It is important for the Government to get its own structures and relationships correct since it is the source of funds for practically all basic research and about half of applied work. There is a need for more effective coordination and policy-making for the new research-based technologies (especially for the emerging technologies) such as information technology, space and biotechnology, which often involve problems affecting many departments. Rather than devise ad hoc arrangements for each, there should be a proper system for identifying those of their needs which demand Government action, and for following them up, often on the basis of ACARD reports.

6. MINISTERIAL AND OFFICIAL ORGANISATION

6.1 In the light of the considerations discussed in Section 5 and the Select Committee's recommendations on a Minister for Science and Technology (IV.11) we now review the existing organisational arrangements, particularly those relating to Ministerial responsibility. The problem is one of how best to provide the benefits of centralisation (ie the ability to take an overview of the whole area, thus identifying any gaps and helping to overcome the problems of a distributed system) without its disadvantages - potential duplication and/or conflict. We have looked at various options on the assumption that the overall scale of resources devoted to basic and applied research would remain the same, as would the balance between these sectors. We have identified four models for Ministerial responsibility, all of which are compatible with the other changes, in particular those at official level, which are described later.

Model 1 - An improved version of the Status Quo

6.2 The present system divides responsibility between the Secretary of State for Education and Science who, advised by the ABRC, has responsibility for support of basic civil science; and Ministers in other departments who have responsibility for the application of science and technology and for the conduct or commissioning of applied R&D within their Departmental spheres. Apart from the role of the Prime Minister (mentioned in paragraph 3.3) coordination is limited to the roles of the Chief Scientist, CPRS, and ACARD and STO and their Secretariat. The advantages of this model are that it firmly focuses responsibility for technology with those who have responsibility for its application; and that it links basic science closely with the universities where so much of it is done. **We suggest** measures elsewhere in this report for strengthening the official coordinating machinery, notably:

a. arrangements for Annual Reviews of Research (5.3);

b. a Committee of Chief Scientists (7.1);

c. a broader role for ACARD (8.5);

d. joint Cabinet office and DES secretariats for ACARD and ABRC;

e. periodic Reports on Science and Technology by the Chairmen of ACARD and ABRC (8.6); and

f. better coordination of international scientific relationships and of arrangements for disseminating information on S & T (9.4 and 9.5).

These moves should have a significant impact while minimising the disruptive effects of organisational change: though additional posts will be needed as a result, which we describe in paragraph 6.9.

Model 2 - A non-executive Minister

6.3 The Select Committee recommended (IV.8) that a senior, ie Cabinet, Minister should be charged with speaking for Science and Technology in addition to other responsibilities; but he would not have a supporting department, and would depend on the limited resources of the Cabinet Office Secretariat/CPRS for support. There is a danger that with so little support he would carry little "clout", and would be dependent for effectiveness on his political standing derived not from this but from his other responsibilities. He might well, therefore, be unable to get a grip on the research priorities of the government.

6.4 It seems to us that to be effective such a non-Departmental Minister would require enough support to ensure that he could collate and review Departmental research programmes through the Annual Reviews of Research (5.3), relating them to the programmes funded from the Science Budget; and that he could draw to his colleagues' attention any problems which were hindering emerging technologies, and promote technology transfer. But it is important not to cut across the customer-contractor links, and he would not spend money directly, since Science Branch would remain in DES. His methods would include regular formal reviews of research plans, and bringing people together to discuss any gaps or potential overlaps. This would imply a coordination role in which Departmental Ministers retained their existing powers but the central Minister could raise issues for collective decision. In this way he would seek to ensure that customers (ie research-commissioning branches in Departments) were alive to the needs of Government as a whole rahter than constrained by Departmental horizons. While ACARD would continue to report to the Prime Minister, he would have day-to-day responsibility for follow-up on her behalf. The role would be an enhancement of the Prime Minister's present interest in science and technology. It would need to consume at least 20% of the Minister's time, though more could be spent if a "high profile" were adopted. So long as the Prime Minister is prepared to take a coordinating role herself (paragraph 3.3) it is not clear that this arrangement would offer significant advantages over Model 1.

Model 3 - A Departmental Minister of State for Science and Research

6.5 Others argue that the job outlined as Model 2 (paragraphs 6.3-6.4) can only be done by a Minister with direct funding responsibility for support of basic science as well as the coordinating role in respect of its application. If the coordinating role were to be concentrated on applied science at the expense of technology it might be an appropriate role for a Minister of State in the DES. He would either be supported by Science Branch (in his Department,

DES) plus a separate small unit in the Cabinet Office and appropriate inter-departmental machinery (together with an enhanced ACARD) on the analogy of the Minister for Information Technology; or, alternatively, by an expanded Office of Science and Research, covering basic and applied science, within DES. The voice in Cabinet would not be that of the Science Minister, but that of the Secretary of State for Education and Science (who, admittedly, might sometimes be influenced by his wider responsibilities). The comprehensive responsibilities given to the Minister of State by this model would help to emphasise the need to bridge the gap between basic and applied research, and to reduce the 'academic' approach to the former; but widening the responsibilities of DES in this way might be criticised as bringing the applied sector into a Department which only has relatively weak links to industry and other users of technology.

Model 4 – A Central Minister for Science and Research

6.6 It might be argued that even these roles would be too limited, and that there should be a Minister with full responsibility for Science who can coordinate policy on both scientific research and the new and emerging technologies. It seems to us that if there is a need for this wider overview and coordination, it would need to be housed outside DES. The best arrangement would be a part-time Cabinet Minister (perhaps devoting about 30% of his time to the role) backed up by a small unit located in the central departments. This unit would be derived from colocation of the present DES Science Branch, with its responsibilities for the Research Councils, the existing Cabinet Office resources, and the extra staff (see paragraph 6.9) to be devoted to the overview and coordination function.

6.7 The chief advantage of this model is that it avoids an anomalous brigading of science responsibility with any one particular area of technology, while building up the links between applied research and basic science and their advisory machinery (ABRC, ACARD). In particular, it would provide Ministers with the means to concentrate resources for basic science, on expert advice, into areas where it was hoped they would be most productive in the development of new technologies. In essence, the aim would be a mild tempering of the current criteria of scientific timeliness and promise currently applied by the peer review system for allocating funds for basic science, with a market-derived input on the need for strategic research. The model would be criticised for threatening the former; neither is it proven that valid identification of worthwhile strategic areas is possible over the necessary time-horizon, though other nations are attempting just such a treatment.

6.8 But this arrangement would break the important link between science and higher education policies. There are other disadvantages: there is a limit to the number of functions which can be given central status, and to bring science into the centre might be seen as in some way unfair; it might not be possible to find an appropriate Minister with both the time and the inclination for the job; and science in the central department would be more exposed to across-the-board cuts than it would be when brigaded with others. Organisationally, too, this model would raise some tricky problems of responsibility and accountability. It would detract from the role in the CPRS of the present Chief Scientist, CPRS, if he were made responsible for managing the new central unit's effort. It would also add significantly to the Accounting Officer responsibilities of the Secretary of the Cabinet (since no other official could readily assume this function).

Manpower

6.9 Whichever model is adopted the increased coordination we propose will mean that some new posts will have to be created within the overall resources available for science and technology in Government. We think that up to 6 new senior posts will be needed, in addition to the existing 2 PSOs (servicing ACARD and STO) and one CPRS adviser, in the Cabinet Office. These would comprise 2 posts at around AS level (subject to Treasury agreement), one of whom would function as an extra Adviser to support the Chief Scientist in CPRS. and up to four posts at Principal level to deal with the remaining extra functions - coordination and overview of Government R&D effort (paragraph 5.3-5.5); input to the ABRC Secretariat (paragraph 8.3); the coordination of work on scientific and technical information (paragraph 9.4) and of international scientific affairs (paragraph 9.5). We estimate the cost of this central unit at around £0.25 million per annum, and there might be some additional load on departments. The aim would be to achieve enough of an improvement in the effectiveness of spending on R&D to justify this use of resources.

Ministerial responsibility - a Summary

6.10 The progression in the four models, then, is that, in addition to strengthening of the official infrastructure, there are the following variations at Ministerial level:-

- Model 1: Ministerial responsibilities unchanged;
- Model 2: basic science remains with DES; a non-executive, non-departmental, central Cabinet Minister reviews and coordinates the totality of Departmental research programmes;
- Model 3: a Minister of State in DES takes on a coordinating role in addition to his executive responsibility for basic science (with the Secretary of State for Education and Science speaking in Cabinet);
- Model 4: a non-departmental Cabinet Minister takes on executive responsibility for the Science Vote as well as the coordinating role.

7. COORDINATION AT OFFICIAL LEVEL

The Committee of Chief Scientists and Permanent Secretaries (STO)

7.1 The Select Committee (IV.35) feel that STO has proved unwieldy and that machinery at a lower working level should be established. Our remit, in addition to general coordination, comprises responsibility for seeing that scientific questions are brought before Ministers as appropriate and that scientific priorities reflect those of Government as a whole. The records show that we have indeed met infrequently. We feel that the Select Committee give insufficient credit to the existing ad hoc and informal arrangements; but we see advantage in formal, umbrella, machinery, to ensure that the other channels are being used effectively. We do not therefore argue for discontinuation of STO; indeed **we intend** to meet on a more regular basis, probably twice a year. Nevertheless we see the value of a working forum where Departmental Chief Scientists can meet, to supplement their existing informal contacts. Accordingly **we recommend** that STO establish a working group of the Departmental Chief Scientists, to be chaired by the Cabinet Office Chief Scientist; and that it should meet approximately quarterly. The deliberations of this group would be concerned with the overall framework of science in Government, and particularly with coordination of research programmes; DES and the Research Councils should be represented.

Military/Civil Coordination

7.2 We agree with the Select Committee (IV.38) that improved arrangements are necessary for coordination of civil and defence research and ensuring that technology can be transferred from defence to civil applications. To this end, we **recommend** that the Chief Scientist, CPRS, and the Chief Engineer, DoI, should become members of the Defence Scientific Advisory Council; though this does mean that their responsibilities would extend to scientific advice on defence issues. The possibility of links between the civilian departments and the Defence Research and Intra-mural Resources Committee (DRIRC) should also be examined. Other questions of technology transfer should be included in the study of information exchange proposed in paragraph 9.4.

8. EXTERNAL ADVISORY BODIES

8.1 Currently, the Advisory Board for the Research Councils (ABRC) advises the Secretary of State for Education and Science on matters concerning the Science Vote; and the Advisory Council for Applied Research and Development (ACARD) sponsored by the Cabinet Office, advises Ministers at large on research and development. Their membership and terms of reference are at Annex C. The purview of the two bodies runs parallel to the funding structure - ABRC advising on money for scientists to pursue work of scientific excellence and promise in either pure or applied research; and ACARD considering the coordination and development of applied research on both a national and an international basis.

Two Committees

8.2 **We consider** that the presence of two bodies in this sector is fully justified by the wide range which they cover, and that no single body would be able to discharge its role satisfactorily (we are at one with the Select Committee (IV.21) in rejecting the notion of any additional bodies). In order to improve coordination, a member of the Secretariat of ABRC should be contributed by the Cabinet Office unit which services ACARD, and a DES official should join the ACARD Secretariat.

The Advisory Board for the Research Councils (ABRC)

8.3 The ABRC has been criticised for dwelling too closely on marginal adjustments to funding, which may have led it to neglect some major policy issues within its remit. We understand however that its recommendations on the distribution of the Science Budget emerge from its 'Forward Look' of the Research Councils where wider and longer term issues do surface. We also note that ABRC has been involved with special studies, namely its own study of postgraduate education, a contribution to the ACARD Biotechnology study, and a current joint study with the UGC on the dual-support system. We **endorse** the view that ABRC should broaden its study of support for science to cover questions affecting the health of basic science as a whole. Opportunity might also be taken of allowing Research Council staff to participate more fully in support for ABRC studies.

The Advisory Council for Applied Research and Development (ACARD)

8.4 The importance of ACARD's remit to advise Ministers and publish reports, and its success in providing access to the Cabinet Office machine for industrialists and outside advisers, seem widely accepted. Most of its reports have been compiled by small working groups which may include

non-members of ACARD. It should continue to report formally to the Prime Minister, though **we consider** it important that there should be clear arrangements for designating a Minister and officials to follow up its recommendations, as discussed in section 6.

8.5 The Select Committee recommend (IV.15) that ACARD extend its coverage and membership, to become a Council for Science and Technology (CST). We understand that ACARD has, in discussion of the Select Committee report, proposed revision of its title to "Council for Research and Technology" and broadened terms of reference. These changes reflect the Select Committee's recommendations, and emphasise ACARD's involvement in the links between pure and applied research. **We recommend** that the terms of reference should be revised as shown in Annex C, paragraph C.8, on the understanding that ACARD should exercise its coordinating function in collaboration with ABRC. However, we think ACARD has established a good reputation, particularly outside Government, and it would be wrong to jeopardise this by a change of title. Accordingly we consider that the title "ACARD" should be retained.

A Report for Science and Technology

8.6 The Select Committee proposed (IV.16) that there should be an annual report on Science and Technology to Parliament, covering scientific opportunities and implications, resource allocations and the cost-effectiveness of research programmes supported by the public sector, bearing in mind the contribution of the private sector. The concept of a periodic Report is attractive, though we believe that a report once every two or three years might be sufficient to meet the need. **We consider** that, in order to ensure that it is an objective critique of events, it could best be presented to the Government by the Chairmen of ACARD and ABRC if they were willing to take on this task. It would form a useful medium to review specific problem areas, establish criteria and assess relative priorities in pure and applied research and in technology. The report would be selective and would not duplicate the existing comprehensive R&D reports provided by some Departments and the Research Councils. The report would also provide an opportunity for public and Parliamentary debate and hence for the evolution of Government policy on science and technology in a steady way rather than the present system which tends to cause major changes at intervals of 7-10 years, depending on the timing of reports which are largely externally generated.

9. A GOVERNMENT CHIEF SCIENTIST (GCS)

9.1 The Select Committee call (IV.12) for re-establishment of a Government Chief Scientist (GCS) post at 2nd Permanent Secretary level, to provide strong central advice on science from within the Cabinet Office: whilst operating in conjunction with the Secretary to the Cabinet and the head of CPRS, he would have the right of direct access to the Prime Minister. As the Committee themselves acknowledge (III.3 and IV.56) the appointment of Dr Robin Nicholson at Deputy Secretary level to the Chief Scientist post with responsibilities both in CPRS and Cabinet Office goes some way towards meeting their points; his terms of reference (at Appendix A of Annex E) cover their main concerns.

9.2 It was largely because Government had already concluded that there was a need for a stronger scientific advisory presence at the centre of Government that the level of the post was raised last year and its remit broadened to put greater emphasis on overall coordination of the Government's scientific interests and effort. At present, Dr Nicholson's post is called Chief Scientist, CPRS. **We recommend** that the broadened remit might be more clearly shown if the post was described as Chief Scientist, Cabinet Office. He should, however, continue to be a member of the CPRS.

9.3 When the previous GCS appointments were made at Permanent Secretary level the system was much more centralised and the responsibilities and range of the GCS were thus wider. It is of course current Government policy that it is not acceptable to confer a certain grade on a post solely on grounds of 'weight' or 'pull'. It is therefore legitimate to conclude that the Government should wait for experience of the new arrangements before making any further changes. Against that, there is the point that if a change is to be made it is best made at the time most likely to ensure full impact within the Government's new response to the provision and coordination of scientific advice. And the grading of the post does have some importance in ensuring that the voice of the Chief Scientist will be properly heard. To some extent the answer depends on the Ministerial option which is to be adopted. At this stage we confine ourselves to **endorsing** the importance of the right of direct access between the Chief Scientist and the Prime Minister, but judge that it will be more usual for the Chief Scientist to advise in conjunction with the head of CPRS and the Secretary of the Cabinet. He should also be available to advise the Treasury as required.

Information on Science and Technology

9.4 The Select Committee express concern (IV.52-53) that not enough effort is put into gathering, coordinating and disseminating the information on science and technology which is available from various sources within the UK and abroad. **We agree** that the existing work needs better coordination. Accordingly, **we suggest** (see also paragraph 6.5, 11.3) that the Chief Scientist, Cabinet Office, in conjunction with the proposed STO sub-committee of Chief Scientists, reports as soon as possible on the effort which Whitehall puts into these areas, with a view to strengthening existing arrangements as necessary.

International Scientific Relationships

9.5 There is also a need for better coordination of international scientific relationships and of the UK appraisal of the scientific programmes of the European Communities, European Science Foundation, UNESCO, NATO, OECD and other bodies. **We recommend** that such coordination should be undertaken under the direction of the Chief Scientist, Cabinet Office.

10. THE ROLE OF DEPARTMENTAL CHIEF SCIENTISTS (DCSs)

10.1 The Select Committee claim (IV.25) that the power and influence of Departmental Chief Scientists (DCSs) has generally declined and that some posts have been eroded and downgraded. They call for at least Deputy Secretary posts in all departments concerned with science or technology, and endorse the Holdgate recommendations on the functions and responsibilities of the DCS. **In our opinion** the role of Chief Scientist should include responsibilities wider than a purely scientific advisory role, including appropriate policy responsibilities. Departments have sought to make satisfactory provision along these lines in their internal structures.

10.2 The Select Committee (IV.23; IV.28-29; IV.36) make some comments regarding specific departments. Annex D discusses these in more detail, but we **do not consider** that the case for a change has been established. Different Government departments naturally have different needs, and there can be no universal pattern. Currently 9 Departments have Chief Scientists named as such but a further 5 with significant numbers of scientific staff do not, though the title of Departmental Chief Scientist may itself be misleading.

Grading of Departmental Chief Scientists

10.3 It is not acceptable to argue for a certain grade on grounds of relative ranking and weight alone; and as Wardale has pointed out, not every grade in the hierarchy need be used in any one structure. The successful functioning of a DCS post is critically dependent on personalities and outlooks - not of just the incumbent DCS but of his colleagues and particularly of his Permanent Secretary. A DCS may be afforded necessary access to top management and to Ministers without bearing the Deputy Secretary label, and this is what has been instituted in MAFF. Conversely, the MOD's Chief Scientific Adviser is a 2nd Permanent Secretary.

11. CIVIL SERVANTS AND SCIENCE AND TECHNOLOGY

11.1 The Select Committee (III.12) feel that other countries have been more successful than ourselves in gearing a technical input to policy. In the UK, the Civil Service has been traditionally based upon a division of responsibilities and structures such that administrators (centrally placed, moving readily between different areas of administration) integrated advice from scientists and technologists (narrowly confined to their specialism, remote from overall consideration of policy and often ineffective in making their points). When scientific and technological factors were relatively simple and often peripheral to decisions this was effective. But the complexity and relevance of such factors and the need to integrate material from different fields of science and to evaluate conflicting evidence have all increased. Following Fulton, the formal distinction between administrators and specialists at the top of the Service has been abolished, and a more consistent use of DCSs as departmental policy advisers has been instituted (with varying degrees of success). Currently the impetus towards bringing those who have both specialist skills and the ability to work effectively as administrators into top policy and advisory posts rests upon implementation of the Holdgate Report, Cmnd. 8032.

The Holdgate Recommendations

11.2 The Select Committee emphasise (IV.43) the importance of the technological generalist scheme recommended by the Holdgate report. **We note** that this and other recommendations are being carried forward by departments in conjunction with the Management and Personnel Office (MPO). **We strongly endorse** the scheme and also the continuing efforts being made in the secondment and interchange fields. **We suggest** that it would be useful for the MPO centrally to monitor progress on the Holdgate recommendations against objectives agreed with departments and to report to Ministers from time to time, perhaps annually.

Listening to advice

11.3 The Select Committee urge (IV.48) better communication between Government and international sources, professional institutions, and universities, to promote better inwards and outwards flow of information and advice. They also hope for a greater openness on the part of Government and reassurance that the role of advisory bodies is appreciated. We have already recommended (9.4) that there should be a comprehensive study of information exchange and dissemination. **We agree** that Ministers and senior officials should develop their links, both formal and informal, to outside sources of expertise; and that they should ensure that those who give advice know what

use has been made of it, or, if it has to be rejected, why. The Reports on Science and Technology (paragraph 8.6) will provide a useful medium for information exchange.

Non-Departmental Public Bodies ('Quangos')

11.4 Whilst the Select Committee regret (IV.49) the closure of certain non-departmental public bodies (the Aeronautical and the Electronics Research Councils are named) **we note** that Ministers keep all such bodies under review and that bodies should be wound up once their useful lifetime has expired. In the named example, functions were transferred to an existing body (Defence Scientific Advisory Council) and **we consider** that experience to date shows the amalgamation to be a success.

12. **SUMMARY**
(Numbers in brackets refer to sections or paragraphs in this paper)

12.1 Having considered the scope of the House of Lords report on Science and Government (2) and the features of the present system with respect both to funding and support of research (4) and organisation (6), **we agree** with the Select Committee's diagnosis that, given the crucial importance of science and technology to the country as a whole, improvements to the present arrangements are necessary.

12.2 We have identified needs for improved coordination and awareness of our scientific effort as a whole, coupled with the means to effect change or to weigh priorities so that the maximum potential can be achieved from the given resources. The most significant question is

A: Whether to accept the Select Committee recommendation that a **Cabinet Minister be charged with speaking for science and technology?**

Other important structural recommendations are:

B: Establishment of a system of **Annual Reviews of Research** (5.3);

C: A change in the terms of reference of ACARD (8.5);

D: That periodic **reports** on Science and Technology be prepared by the Chairman of ABRC and ACARD (8.6).

12.3 Turning to other of the Select Committee recommendations on arrangements at senior levels within the Service, we consider:

E: That the Select Committee's main points regarding the **remit** of a **Government Chief Scientist** have been already met in the recent appointment of the Chief Scientist, CPRS. **We feel** that he could with advantage bear the title of Chief Scientist, Cabinet Office. For the time being, **no conclusion** can be drawn as to further change in the grading of the post; we must await experience of the current arrangements (9.3);

F: That the situation in departments with regard to the appointment and deployment of Departmental Chief Scientists is **satisfactory** (10.1).

12.4 We have made a number of more particular recommendations as follows:

G: That work on the **technological generalist** scheme, and efforts on **interchange** and **secondment** opportunities, are carried forward as recommended by the Holdgate report, and that the **MPO makes a progress report annually** to Ministers (11.1-11.2);

H: That a study of the **scientific information** available within the UK and from international sources, and the use to which it should be put, is made by the Chief Scientist, CPRS (9.4);

J: That the Chief Scientist CPRS should direct the **coordination of international scientific relationships** (9.5);

K: That this Committee, **STO, establish a working forum** of Departmental Chief Scientists, with representation of DES and the Research Councils (7.1);

L: That the suggested cross-membership between bodies concerned with **civil and defence science** be put into effect (7.2).

12.5 We attach a draft Government response to the Select Committee in the form of a White Paper (to be presented by the Prime Minister). This is drafted on the assumption that there is no change in Ministerial responsibilities.

April 1982

ANNEX A

HOUSE OF LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

SCIENCE AND GOVERNMENT REPORT (HL 20-I, 9 December 1981)

The following is a brief summary of Chapter IV of the Report, "Opinion of the Committee and Recommendations". Numbers in brackets refer to the paragraphs in Chapter IV.

CONCLUSIONS

1. The present system of scientific advice to the UK Government goes a long way to meeting the prime objectives. (6)

2. There is no support for a separate "Department of Science and Technology". (8)

3. It is essential that there is a strong voice in Cabinet for S&T. (9)

4. Both effective Ministerial review of S&T and strengthened provision of advice to Cabinet collectively by a Government Chief Scientist would be substantially helped by a Council of Science and Technology (CST). (15)

5. The power and influence of Departmental Chief Scientists have declined over the past 5 years. (25)

6. There is too rigid a distinction between basic and applied research; the former, funded through the science budget of DES, may have immediate relevance to industry but may be endangered for lack of a full assessment of the implications to Departmental policies. (31)

7. The paucity of scientists and engineers coming through as potential Permanent Secretaries is a structural weakness. (39)

8. Improved mobility of manpower between different sectors of employment is desirable. It must be apparent that secondment is in the interests of the employee. (45, 47)

9. The extra cost of implementing the Committee's recommendations is small and will be more than compensated by the returns from a better application of public expenditure. (55)

10. Many of the functions which the Committee have identified as necessary are in fact being carried out by one means or another. The Prime Minister is her own Minister for Science and Technology. Dr Ashworth approached the Government Chief Scientist role envisaged by the Committee and Dr Nicholson's remit and higher rank go some way to acknowledge this. All the functions of a 'CST' are not being carried out at present, but ACARD has a tendency to interpret its terms of reference as widely as possible. (56)

RECOMMENDATIONS OF THE SELECT COMMITTEE

1. A Cabinet Minister for Science and Technology (in addition to other responsibilities) should be designated. (11)

2. A Government Chief Scientist should be appointed to operate in concert with both the Head of the CPRS and the Secretary of the Cabinet in bringing forward scientific and technological advice of all kinds to Cabinet, whether at their behest or on his own initiative. The GCS should be at least at Second Permanent Secretary level. (12)

3. A Council of Science and Technology (CST) should be established to:

- present an annual "state of the nation" report on S&T to Parliament
- help Ministers review and concert the national scientific effort
- fill the gap between advice from Research Councils/universities and Departmental policy/needs of industry
- spur technology transfer from the defence sector to civil industry. (15, 16, 17)

4. This Council should:

- be served by a small full-time Secretariat
- be geared to, but independent of, central machinery
- have an independent part-time chairman
- report to the senior Minister speaking for S&T in Cabinet. (18)

5. Membership of CST should cover Government, industry, universities, Research Councils and science and engineering bodies, and also include the Government Chief Scientist, Chairmen of ABRC and UGC, Departmental Chief Scientists, and representatives of the Royal Society. CST should have links with NEDO and the Treasury. (18, 19)

6. CST should absorb ACARD's function and take its place. (21)

7. ABRC should retain its management role but should have a more nearly full-time Chairman who would perform the function of a "Chief Scientist" for DES. (23)

8. Departments concerned with S&T should have a Chief Scientist (at Deputy Secretary level or above) integrated into the decision-making machinery and clear of day-to-day research management. (26, 27)

9. The DOI Requirements Boards provide a model for inter-departmental customer boards and the management of research programmes spanning departmental interests. (32)

10. The Government should consider how to make inter-departmental coordination more effective (perhaps at a slightly lower level than the Committee of Permanent Secretaries and Chief Scientists) to support the CST in helping to define overall Government R&D strategy. (35)

11. Treasury Ministers should be in touch with the Government Chief Scientist when weighing proposals from departments against their cost and benefit. (36)

12. DOI and D.Energy should be represented on the Defence Scientific Advisory Council. The Government Chief Scientist should have a concern with defence, at least as far as identifying links between defence and civil science and their application. (38)

13. A "technological generalist" scheme should be instituted as soon as possible. (43)

14. The proposed CST should give early consideration to international aspects of scientific advice to Government. (52)

ANNEX B

DEFINITIONS

B1. **Science** is the knowledge and understanding of natural phenomena. It is sometimes called **basic science.**

B2. **Applied** science is the generation of knowledge and understanding of natural phenomena with the object of improving products and processes of practical use.

B3. **Engineering** is the design, development, manufacture and maintenance of useful goods and services related to them.

B4. **Technology** is the science of the industrial and practical arts.

B5. **Research** is the process of enquiry into the natural and man-made world. It is the means of generating new science and technology.

B6. **Basic** research is carried out for the purpose of advancing scientific knowledge. Such research is also called **Fundamental** or **Pure.**

B7. **Applied** research is carried out with an end-product or objective in view, eg a new product, process or method of operation (Cmnd 5046, paragraphs 6 and 7). Since practical development of the research is required to attain the end-product, the whole process is normally known as **Applied Research & Development.** A related term is **Engineering research** which is the combination of new scientific discovery with practical design and development (Finniston Report, Cmnd 7794, page 108, Note 2).

B8. **General** research is undertaken to sustain and enhance the intellectual capital of a research laboratory, eg to carry out necessary fundamental research (which has not been done elsewhere) for an applied R & D project, to test way-out and novel ideas and to maintain and develop skills in experimental techniques (Cmnd 4814, paragraph 15). General research is sometimes called **Strategic, Generic** or **Underlying** research.

B.9 The **Rothschild principle** (Cmnd 4814 paragraph 6) of R&D states that: "The customer says what he wants; the contractor does it (if he can); and the customer pays".

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ANNEX C

ABRC AND ACARD: MEMBERSHIP AND TERMS OF REFERENCE

The Advisory Board for the Research Councils (ABRC)

C.1 The ABRC, formed in 1972 on the demise of the Council on Scientific Policy (CSP), advises the Secretary of State for Education and Science and his responsibilities for Civil Science "with particular reference to the Research Council system" and including "the allocation of the Science Budget amongst the Research Councils and other bodies". (The "other bodies" which receive subventions direct from the Science Budget are the British Museum (Natural History) and the Royal Society - both of which exercise functions in the support of the research; their subventions are relatively small.)

C.2 The ABRC membership comprised (1981) the head of each of the Research Councils and the Chairman of the UGC, the Chief Scientists of the CPRS and of Government Departments with a major interest in the work of the Research councils, a number of independent members drawn from universities (4), and industry (2); several members are also Fellows of the Royal Society. The Chairman is also independent - currently Sir Alec Merrison, Vice-Chancellor of Bristol University.

C.3 The ABRC Secretariat is drawn from the Science Branch of the DES; this comprises two Secretaries at AS and Principal level, each about half time, with an HEO in support, and another Principal with a part-time commitment, eg on project work. Its terms of reference are as follows:

> "a. To advise the Secretary of State for Education & Science on his responsibilities for civil science, with particular reference to the research council system, its articulation with Universities and departments, the support of post-graduate 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 among 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."

The Advisory Council on Applied Research and Development (ACARD)

C.4 ACARD, like STO, was established in 1976; it first met in January 1977. Its terms of reference are currently as follows, although ACARD themselves have proposed a revision in the light of the Select Committee Report:

> To advise Ministers and to publish reports as necessary on -
>
> i. applied R and D in the United Kingdom and its deployment in both the public and private sectors in accordance with national needs;
>
> ii. the articulation of this R and D with scientific research supported through the Department of Education and Science;
>
> iii. the future development and application of technology;
>
> iv. the role of the United Kingdom in international collaboration in the field of applied R & D.

C.5 Following Dr Spinks' death, Sir Henry Chilver, Vice-Chancellor of Cranfield Institute of Technology, is the present Chairman of ACARD.

Membership is predominantly engineering/industrial although the ABRC Chairman is included and Chief Scientists of Cabinet Office, DEn, DOE, DoI and MOD attend as assessors. During 1981 membership comprised ten representatives of industry, industrial research, and the engineering profession at board member/senior executive level. There is provision for 2 trade union members. Two Principal Scientific officers from the Cabinet Office form the (practically full-time) Secretariat to ACARD; the Chief Scientist, CPRS and CPRS Advisers may also make an input here.

C.6 The Council's published reports, available from HMSO, are:

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
Computer Aided Design and Manufacture (1980)
R & D for Public Purchasing (1980)
Biotechnology (1980) (with ABRC and Royal Society)
Information Technology (1980)
Exploiting Invention (1981)

PROPOSED REVISED TITLE AND TERMS OF REFERENCE

C.7 The following revised title and terms of reference have been suggested by ACARD to enable it to carry out most of the tasks envisaged in the Select Committee's report for their Council for Science and Technology.

"COUNCIL FOR RESEARCH AND TECHNOLOGY (CoRT)

To advise the Prime Minister and Ministers and publish reports as necessary on:-

- applied research, design and development in the United Kingdom;
- the application of research and technology for the benefit of both the public and private sectors in accordance with national economic needs;
- the co-ordination of these activities with basic research and associated functions supported through the Department of Education and Science;
- the role of the United Kingdom in international collaboration in the fields of applied research, design and development related to technology".

C.8 As described in paragraph 8.5, these revised terms of reference could be accepted subject to

a. inserting "developed in the UK and elsewhere" after technology in the fourth line;

b. inserting "in collaboration with the Advisory Board for the Research Councils" after coordination in the seventh line;

c. deleting "basic" and "and associated functions" in the same sentence.

ANNEX D

DEPARTMENTAL CHIEF SCIENTISTS

A Chief Scientist for HM Treasury?

D.1 The Select Committee noted (IV.36) the Treasury's need for access to expertise on science and technology in its role of agreeing Civil Estimates. Treasury officials doubt whether a single Chief Scientist could advise over the whole range of spending programmes; in any case, decisions on priorities within PES blocks are largely for Departmental Ministers. However, we **recommend** that the Chief Scientist, CPRS should be available to the Treasury for advice when required. We describe in paragraphs 5.3-5.5 a comprehensive analysis of Government spending on R&D which would be a useful tool for the Treasury.

A Chief Scientist for DES?

D.2 The Select Committee thought (IV.23) that the Chairman of ABRC should be invited to perform some of the functions of a Chief Scientist for DES. However, there are existing arrangements for the provision of advice on science teaching at all levels, from HM Inspectorate of Schools in relation to schools and maintained and voluntary further and higher education and by the UGC in respect of the Universities. The DES only commissions a limited amount of educational research. The arrangement proposed would detract from the independence of the Chairman of ABRC and **we do not recommend** it.

A Chief Scientist for the Scottish Office?

D.3 At present there is a Chief Scientist only in the Scottish Home and Health Department. The Committee recommends (IV.28) consideration of the Royal Society of Edinburgh's proposal for a wider Chief Scientist structure. The Scottish Office **conclude** that for a number of reasons it is not a practical proposition. First and perhaps most important, it is impracticable to require a single DCS to deal authoritatively with the whole range of scientific advice which is needed by the five separate Departments within the Scottish Office and to maintain the necessary close contacts with the policy makers in all the diverse areas of work to be covered; it would be difficult, if not impossible, to recruit an appropriate person for such a job. There is already a considerable body of scientific and other research advice available within the Scottish office, geared to meet most of the Scottish office specialist needs. Nevertheless, **it is recognised** that Scottish Departments will require further scientific advice, and that frequently it will not be available in-house. Experience has shown that expert advice is readily available from appropriate committees. In such a way, better and more selective use of expertise may be made than could be achieved from formal links to corporate bodies or societies. Nevertheless, there is no reason why bodies such as the Royal Society of Edinburgh cannot, on their own initiative, identify appropriate departmental interests and approach the Scottish Office directly.

Scientific Advice to MAFF

D.4 The changes in the top structure of MAFF, to which the report refers (IV.29), have been in effect for slightly less than a year. Already, however, **it is evident** that they are working well. The two Chief Scientists, in close cooperation with their Deputy Secretaries and their scientific staff, have improved the coordination of the Ministry's research programmes with its policy interests and have contributed to the increasingly close relationship of the Ministry with the Agricultural Research Council. The new arrangements allow scientific advice to be much more closely integrated into the process of decision making.

Annex E

DRAFT COMMAND PAPER GOVERNMENT RESPONSE TO THE REPORT BY THE SELECT COMMITTEE OF THE HOUSE OF LORDS ON SCIENCE AND TECHNOLOGY ENTITLED "SCIENCE AND GOVERNMENT"

The Government are grateful to the House of Lords Select Committee on Science and Technology for their valuable and stimulating review of the arrangements for scientific advice to government. In general, the Government fully **accept** the main thrust of the Select Committee's report; that the Government has a responsibility to secure an adequate scientific and technological input to policy-making. The Government **concur** with the Commmittee's outline of departments' need for advice (paragraph IV.2) and their view that what is needed is a strengthening of the centre rather than wholesale reorganisation (IV.6). As the Committee say, the machinery by which advice is to be tendered is less important than the ability, will and perseverance to seek and use such advice.

2. This response, like the Committee's report, covers the fields of science and research, and their relation to technology: but it does not cover the wider aspects of the Government's approach to technology.

3. Excellence in the development and exploitation of science and its applications is essential if the economic prosperity of the country is to be advanced in the coming decades, and if companies based on science and technology are to play their part in providing new employment opportunities. These objectives demand effective management of the limited resources (of both skills and cash) available, and mechanisms for ensuring that Government policies take full account of scientific opportunities and implications. The measures described in this paper are designed to aid the implementation of these objectives, which the Government regard as being of high priority.

Departmental responsibility

4. The Select Committee believe that the integration of science and technology into policy departments is beneficial, and consider that there should not be a separate executive department responsible for all aspects of science and technology. The Government **agree**; it would be wrong to weaken the present responsibility of each Minister for securing the scientific advice he

needs and for ensuring that his department commissions a suitable research programme. The changes set out below build upon this responsibility and on the customer - contractor principle for applied research*.

Chief Scientist, Cabinet Office

5. The Committee recommend that a Government Chief Scientist should be appointed at Second Permanent Secretary level (IV.12). The Government **accept** the need for a senior scientist at the centre to fulfil the general role set out in paragraph IV.13 of the Select Committee's report. However, they **consider** that the appropriate title for the post is that of "Chief Scientist, Cabinet Office"; the job description is at Appendix A. As recommended by the Committee (IV.14), the Chief Scientist will have the right of direct access to the Prime Minister (as now). He will continue to be a member of the CPRS and to provide the CPRS with scientific and technological advice.

6. The post was upgraded recently to Deputy Secretary when the present incumbent was appointed. The Government will await experience of the new arrangements before drawing a conclusion as to any further change in the grading of the post. The Government **accept** the Select Committee's conclusion (paragraph IV.14) that the Chief Scientist, Cabinet Office will require a small Unit to support him; this will be established in the Cabinet Office. The costs are within the totals given in paragraph 26.

Central Advisory Machinery on applied research

7. The Select Committee recommend (IV.15-IV.22) the establishment of a Council on Science and Technology (CST), with a remit that would cover the whole of scientific and technological endeavour and its implications for the policies and strategies of Departments and Government as a whole. However, the Committee consider that the Advisory Board for the Research Councils (ABRC) should be retained. The Government **accept** the need for high-level independent advice and for the retention of the ABRC, but **consider** that the improvement in the central advisory machinery should mainly be achieved by encouraging the Advisory Council for Applied Research and Development (ACARD) and ABRC to broaden their fields of study so that there is no gap in the coverage of the research spectrum.

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* as described in the Rothschild Report, Cmnd 4814, 1971, accepted by the Government in Cmnd 5046, 1972, and reviewed in Cmmnd 7499, 1979.

Advisory Council for Applied Research and Technology (ACARD)

8. ACARD has recommended, in the light of the Select Committee's Report, that its own terms of reference should be revised and extended. They should enable it to cover the fields of applied research, design and development and the application of research and technology, together with the coordination of these activities with basic research. The Government **accept** ACARD's proposal, which goes a long way to meeting the Select Committee's recommendations, and have given it the following new terms of reference:-

"To advise the Government and publish reports as necessary on:-

- applied research, design and development in the United Kingdom;

- the application of research and technology, developed in the United Kingdom and elsewhere, for the benefit of both the public and private sectors in accordance with national economic needs;

- the coordination, in collaboration with the Advisory Board for Research Councils, of these activities, with research supported through the Department of Education and Science;

- the role of the United Kingdom in international collaboration in the fields of applied research, design and development related to technology".

Advisory Board for the Research Councils (ABRC)

9. The Government **agree** with the Committee (IV.23) that there should be no change in the ABRC's present role in the management of the research councils and in advice to the Department of Education and Science on that part of civil science supported by the Science Budget. The Government **take note** of the other points made by the Committee about ABRC (IV.23-24). In future, a member of the Secretariat of ABRC will be contributed by the Cabinet Office Unit which services ACARD, and a DES official will join the ACARD secretariat. Joint secretariats of this sort should help to ensure coordination between basic and applied science, and between the two advisory bodies, without disturbing the present distribution of responsibilities.

An Annual Report for Science

10. The Committee proposed that their Council for Science and Technology would submit an annual "state of the nation" report (IV.16). The Government **agree** that such a periodic report would be valuable (though not necessarily as frequently as once a year) and will ask the Chairmen of ACARD and ABRC to present joint reports to the Government. These would, as the Committee recommend, review scientific opportunities and their implications, on a selective basis, as well as reporting on the Annual Review of Research described below. They will not necessarily be confined to activity in the public sector.

Departmental Chief Scientists

11. The Government **accept** the views of the Committee that Departmental Chief Scientists should have a wide-ranging role in Departmental policy making, and should not be too involved in detailed research management, (IV.26). **They consider** however that Departments are in fact making satisfactory provision for scientific advice, though arrangements will continue to evolve to meet changing needs. The Government **do not accept** the Committee's suggestion (IV.25) that the power and influence of Departmental Chief Scientists have declined, nor that all these posts have to be graded at Deputy Secretary level or above. The grading used must reflect the responsibilities allocated to the post and the needs of the Department. A Departmental Chief Scientist may be afforded the necessary access to top management and Ministers even though serving in a grade lower than that of Deputy Secretary. The Government's views on the particular arrangements noted by the Committee are set out below.

HM Treasury

12. The Select Committee noted (IV.36) the Treasury's need for access to expertise on science and technology in its scrutiny of departmental Estimates. The Government **doubt** whether a single Chief Scientist could advise over the whole range of spending programmes; in any case, decisions on priorities within PES blocks are largely for Departmental Ministers. However, the Chief Scientist, Cabinet Office, will be available to advise the Treasury when required. Paragraphs 19-21 describe a procedure for Annual Reviews of Research which should meet the need to address the important questions with which the Select Committee thought a Chief Scientist in the Treasury would be concerned.

Department of Education and Science

13. The Committee suggested (IV.23) that the Chairman of ABRC should be invited to perform some of the functions of a Chief Scientist for DES. However, there are existing arrangements for the provision of advice on science teaching at all levels, by HM Inspectorate of Schools, in relation to schools and maintained and voluntary further and higher education, and by the University Grants Committee in respect of the Universities. The DES commissions only a limited amount of educational research. The arrangement proposed by the Committee would detract from the independence of the Chairman of ABRC.

The Scottish Office

14. The Government have, as recommended by the Committee (IV.28), considered the Royal Society of Edinburgh's proposal for a Chief Scientist in the Scottish Office and **conclude** that the aims of this recommendation can be better achieved by other means. It is impracticable to require a single Scientist to deal authoritatively with the whole range of scientific advice which is needed by the five separate Departments within the Scottish Office and to maintain the necessary close contacts with the policy makers in all the diverse areas of work to be covered; it would be difficult, if not impossible to recruit an appropriate person for such a job. There is, of course, a Chief Scientist in the Home and Health Department. However, Scottish Departments will require scientific advice beyond that available in-house. Experience has shown that expert advice is readily available from appropriate committees. In such a way, better and more selective use of expertise may be made than could be achieved from formal links to corporate bodies or societies. Nevertheless, there is no reason why bodies such as the Royal Society of Edinburgh cannot, on their own initiative, identify appropriate departmental interests and approach the Scottish Office directly.

Ministry of Agriculture Fisheries and Food

15. The changes in the arrangements for scientific advice in MAFF to which the Committee refer (IV.29) have been in effect for slightly less than a year. Already, however, it is evident that they are working well. The two Chief Scientists, in close cooperation with their Deputy Secretaries and their scientific staff, have improved the coordination of the Ministry's research programmes with its policy interests and have contributed to the

increasingly close relationship of the Ministry with the Agricultural Research Council. The new arrangements allow scientific advice to be much more closely integrated into the process of decision making. The Government **conclude** that these arrangements should be allowed to stand.

R&D Funding: mechanisms and principles

16. The Committee are concerned tha there is too rigid a distinction between basic and applied research, and that certain areas of research are being neglected. The Government **note** this concern and will ask ACARD and ABRC to review the links between basic and applied research and, in particular, to look at the arrangements for long-term but directed research - often known as "general research"* or, as termed in paragraph IV.30 of the Committee's report, "strategic research".

Inter-Departmental Coordination

17. The Committee consider that more constructive use of the general machinery for interdepartmental coordination is required (IV 34-35), and that there is a place for a forum at a level below that of the current Committee of Permanent Secretaries and Chief Scientists. The Government **accept** this proposal and are establishing a Committee of Departmental Chief Scientists, chaired by the Chief Scientist, Cabinet Office. This group will be concerned with the overall framework of science within government, and particularly with coordination of research programmes; arrangements will be made for DES and the Research Councils to be represented.

18. The Committee recommended (IV.37-38) enhanced coordination between civil and defence research programmes, and further efforts to ensure that inventions developed by defence research are exploited for the benefit of the economy. The Government **accept** the need for improved coordination and to achieve this, the Chief Scientist, Cabinet Office, and the Chief Engineer and Scientist, Department of Industry, will join the Defence Scientific Advisory Council as the Committee recommends (IV.38), and also the Defence Research and Intramural Resources Committee. At a lower level, Department of Industry and other civil departments are invited to join in the MOD's reviews of the programmes of their research establishments. Ministry of Defence officials are already involved with the appropriate Department of Industry Research

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* The Rothschild Report, Cmnd 4814, 1971

Requirements Boards and will continue to be drawn into other departments' research-commissioning arrangements.

Annual Reviews of Research

19. A central theme of the Select Committee's recommendations (see, for instance, paragraph IV.36) was the need for more effective review of the broad deployment of effort in science and technology. In a financial context, the problem is a familiar one: how to take a horizontal look at particular types of public expenditure when the main control processes operate vertically by slicing expenditure into individual departmental programmes. At present, there is no overall review of Government R&D plans in the Public Expenditure Survey (PES) cycle. This is a significant contrast to typical private sector practice where research plans produced by operating divisions and by the R&D department are reviewed independently at Board level.

20. The Government have therefore **decided** to introduce a system of Annual Reviews of Research. Departments will submit a summary of their research programmes and budgets, to be reviewed inter-departmentally, with independent advice from ACARD, during the early months of the year; this timetable would allow Departments to revise their plans during the next PES cycle in the light of the results of the Review.

21. The analysis required will not be a facile choice of areas where more money should be spent. In the Government's view, overall UK expenditure on research and development as a percentage of GDP is sufficient. Skilful value judgements as to allocation of financial and manpower resources are, however, needed. This will involve distinguishing between vital and dormant areas, identifying gaps, disparities and duplications, and considering the opportunity cost of relinquishing certain areas of research. The emphasis will be on review of long-term plans.

Civil Service Issues

22. The Select Committee emphasise, in paragraph IV.39-IV.42, the need for changes in attitudes to science and technology in the Civil Service and more generally. They endorse the technological generalist scheme described in the

Report of the Holdgate Committee* and call for a greater flow of scientists and others in and out of the Civil Service. The Government **note** the general points made and will follow them up in implementing the Holdgate recommendations which are being carried forward by departments in collaboration with the Management and Personnel Office (MPO)≠. The MPO will monitor progress on the technological generalist scheme and other recommendations against objectives agreed with departments, and will report to Ministers. Continuing efforts will be made to ensure that secondment and interchange arrangements succeed, and that staff are clear that such wider experience will be of real benefit to their careers.

External communication

23. The Select Committee were concerned (IV.48) at evidence which described as inadequate the current channels of communication between Government and the scientific and technological community. They recommend a review of relationships with outside bodies. The Government **accept** the importance of keeping these channels of communication open and effective. Indeed, the Government is probably more reliant on external advice in relation to science and technology than in relation to almost any other area. The Government **do not consider** that new formal machinery to articulate the formation of this advice is required, but will always consider carefully advice from scientific societies and engineering institutions as to issues which require further study. It is the Government's general policy to keep the structure of advisory bodies under regular review and to wind them up once their usefull lifetime has expired. Such reviews will not overlook the wider benefit, in terms of understanding of Government, that membership of such bodies can bring.

24. The Committee also express concern (IV.50) - repeated in the subsequent debate in the House of Lords - over the lack of feedback to those who have given advice. The Government **agree** that members of advisory committees and similar bodies should always receive some indication of the outcome of their advice, particularly if it cannot be accepted.

25. The Committee also comment (IV.51-53) on the need to improve relations with the engineering profession, especially in the light of the establishment

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* Review of the Scientific Civil Service (1980) Cmnd 8032,
≠ The Government Response to Cmnd 8032, CSD 1981.

of the new Engineering Council (on which the Committee will no doubt have more to say in its further report on Engineering Research and Development); and on the need to improve the machinery for receipt and dissemination of scientific information from abroad. The Government **note** these points; international links will be a particular concern of the Chief Scientist, Cabinet Office, in his strengthened role.

Costs

26. As the Committee say (IV.55), there will be some cost in establishing these improved arrangements for central coordination of science and technology. The Government estimate that around 6 new senior posts are required, which will cost about £1/4 million. These new posts will in the main be concerned with support to the Chief Scientist, Cabinet Office, in the improved review and coordination roles described in this Paper, and in servicing ACARD and ABRC. The Government believe that the benefits of improved decision-making will more than justify this cost, which will be contained within the overall resources available for science & technology in Government.

A Central Minister for Science

27. The Committee **recommend** (IV.11) that a Cabinet Minister should be designated to speak for Science and Technology, in addition to other responsibilities. But, as they note (II.13), the Prime Minister has herself said, in a Written Answer (HC Deb. 29 Oct 1979 cc411-12) "Issues may arise which straddle the responsibility of several Ministers to such an extent that it would not be sensible to ask one of them to take the lead. In such a case I would myself play a coordinating role. I would also, where this was appropriate, answer questions in the House on broad scientific and technological issues involving several Departments".

The Government believe that the stronger machinery at official level outlined above, together with this role of the Prime Minister, means that scientific or technological issues are unlikely to be lost or forgotten. They do not believe that there is - within the British system of Cabinet Government - at present an identifiable and viable role for a coordinating Minister, and accordingly, **do not agree** with the Committee's recommendation.

28. The Government are confident that the revised arrangements set out in this response will lead to more effective articulation of the UK's very

considerable efforts in science and research, at all levels from basic research to product development, with other activities of government. They are in no doubt of the importance of science and technology in assuring the well-being of the people of the United Kingdom.

27 April 1982

Appendix A

THE REMIT OF THE CHIEF SCIENTIST, CABINET OFFICE

The Chief Scientist provides scientific and engineering advice for the CPRS and the Cabinet Office generally. He sits on the principal Committees which deal with the scientific and technological issues that come before Government except for those which are solely the concern of a single department. He is the Government's scientific representative on many international occasions.

A.2 **Cabinet Office.** The Prime Minister and the Secretary of the Cabinet looks to the Chief Scientist, Cabinet Office, to provide, or organise the provision of, advice on scientific and technological matters, or scientific and technological aspects of other issues, which come to the Cabinet Office.

A.3 **CPRS.** The Chief Scientist, Cabinet Office, is a member of CPRS and is responsible for providing scientific and technological input to CPRS studies. However, he is not constrained by title and has the opportunity to contribute to issues which are not overtly scientific or technological.

A.4 **Government Committees.** The Chief Scientist, Cabinet Office, is ex officio a member/assessor of the Advisory Council for Applied Research and Development (ACARD), the Advisory Board for the Research Councils (ABRC), and is also a member of the Committee of Chief Scientists and Permanent Secretaries. The Chief Scientist is the prime link between ACARD and the Government and plays a central role in planning ACARD's work.

A.5 **International Affairs.** The Chief Scientist, Cabinet Office, has a general responsibility for coordination of international scientific and technological relationships, covering in particular:

a. The UK's bilateral scientific and technological agreements with other countries.

b. The European Community R&D Budget. The Chief Scientist is UK membre titulaire on CREST (the Committee that advises both the Council of Ministers and the Commission).

c. The Chief Scientist is often asked to attend (or accompany Ministers attending) general fora on scientific and technological topics organised by bodies such as the OECD, UNESCO, etc.

d. The research plans and budgets of other international organisations.

vb

Parliament

MR. WRIGHT
CABINET OFFICE

House of Lords Select Committee on Science and Technology Report: Science and Government

The Prime Minister has seen and noted Sir Robert Armstrong's minute of 9 March, reference A07759,

WFSR

10 March 1982

Prime Minister.

Ref. A07759

PRIME MINISTER

House of Lords Select Committee on Science and Technology Report: Science and Government

I have received from Sir Henry Chilver, the acting Chairman of the Advisory Council for Applied Research and Development (ACARD), a note of the Council's views on the Select Committee report. He asks that the note be brought to your attention. A copy is attached.

2. As I indicated in my minute of 8 January (A07102), I have arranged for the Official Committee on Science and Technology (STO) to consider the advice to be submitted to Ministers on action to be taken and the reply to be made to the Select Committee. I am therefore circulating ACARD's views to the members of STO for their information, and to Mr A M Fraser (Management and Personnel Office) and Dr R B Nicholson (Central Policy Review Staff) who are drawing up proposals for STO to consider.

3. In reply to Sir Henry Chilver, I have said that I am drawing ACARD's views to your attention, as he requested, and that they will be taken into account in considering the Select Committee's report and preparing the Government's response.

RCA

ROBERT ARMSTRONG

9 March 1982

House of Lords Select Committee Report: Science and Government

RESPONSE BY ACARD

1. The Council considers its ultimate aim to be the improvement in competitiveness of the products and services of British industry. This has been the main thrust of ACARD's advice since its foundation.

2. The Council therefore welcomes the Select Committee's report as being particularly timely in view of the impending upturn in the British economy. In this resurgence, technological excellence has a vital part to play, and the Government has an opportunity to stress this in its reply to the Select Committee. To strengthen the body of advice which Ministers receive on applied research and technology would be to implement the report in a way conducive to industry's recovery. We urge the Government to seize this opportunity.

3. Although we do not undervalue the importance of basic research and the education and training functions associated with it, we do feel strongly that the application of research and technology should have first place when Ministers consider matters relating to science and technology in the context of national economic needs.

4. ACARD already has strong links with basic research through cross-membership with the Advisory Board for the Research Councils (ABRC). We envisage that ABRC would continue to be responsible for basic research and its associated functions - including those of a more applied nature such as are undertaken by the Science and Engineering Research Council - and for the "science vote".

5. Our basic research is of outstanding quality and our objective would be to extend the influence of markets so that the nation reaped the benefits of its excellent basic research in terms of the creation of wealth, which can in turn be used for further advances in scientific understanding. The Council considers that its present remit (Annex 1) approximates to that required of the primary advisory body for Ministers in science and technology. There should however be a recognition that technology need not be developed in the United Kingdom for it to be used here effectively. Some adjustment of the Council's title and terms of reference would therefore be needed to define and reinforce its revised role. (A suggestion is at Annex 2).

6. We do not believe that the concentration of responsibilities for science and technology in the hands of a single Minister, or the designation of a single voice for the subject in Cabinet, would improve on the present arrangements. We do not consider that the re-arrangements which the Select Committee proposes would necessarily justify the difficulties and disruption involved. At present, ACARD advises Ministers through the Prime Minister and we consider that the practice should continue under the Council's revised remit.

7. We welcome the appointment of Dr Robin Nicholson as Chief Scientist in the Cabinet Office with responsibilities - so we understand - similar to those advocated by the Select Committee for the "Government Chief Scientist". We consider that the Chief Scientist has a crucial role to play alongside ACARD in bringing issues of applied research and technology to the attention of Ministers at the highest level. No new appointment is therefore necessary. We would however emphasise the need for the Chief Scientist to have adequate resources at his disposal. We understand that this is not the case at present; if so, it should be speedily remedied.

8. An influential body of advice to Ministers will be needed for as long as those in Government are not fully conversant with the implications of technology. We strongly endorse the Select Committee's conclusion that there is an overwhelming case for a changed attitude to science and technology in the Civil Service. The Holdgate report, and many others before it, have stated the problems clearly, but achievement has been patchy. What is needed now is a critical review of ways of achieving progress, not restatements of the problem.

5 March 1982

ANNEX I.

The Advisory Council for Applied Research and Development (ACARD) was established in 1976 with the following terms of reference:

'To advise Ministers and to publish reports as necessary on -

i. applied R and D in the United Kingdom and its deployment in both the public and private sectors in accordance with national needs;

ii. the articulation of this R and D with scientific research supported through the Department of Education and Science;

iii. the future development and application of technology;

iv. the role of the United Kingdom in international collaboration in the field of applied R and D.'

REVISED TITLE AND TERMS OF REFERENCE

The following revised title and terms of reference suggested for ACARD would enable it to carry out most of the tasks envisaged in the Select Committee's report for the 'Council for Science and Technology'. They would help foster that technical excellence which will be vital for the resurgence of the British economy.

COUNCIL FOR RESEARCH AND TECHNOLOGY [CORT]

To advise the Prime Minister and Ministers and publish reports as necessary on:

- applied research, design and development in the United Kingdom;

- the application of research and technology for the benefit of both the public and private sectors in accordance with national economic needs;

- the co-ordination of these activities with basic research and associated functions supported through the Department of Education and Science;

- the role of the United Kingdom in international collaboration in the fields of applied research, design and development related to technology.

RESTRICTED file ds

Parliament

10 DOWNING STREET

From the Private Secretary

MR. WRIGHT
CABINET OFFICE

Select Committee on Science and Technology: Report on Science and Government

The Prime Minister has noted without comment Sir Robert Armstrong's minute of 8 January on the House of Lords' Select Committee Report on Science and Government.

11 January 1982

RESTRICTED

VLS

Prime Minister (2)

For information at this stage.

MLS 8/1

Ref. A07102

PRIME MINISTER

Select Committee on Science and Technology: Report on Science and Government

The House of Lords Select Committee on Science and Technology published its report on Science and Government on 9 December 1981.

2. The principal recommendations of the report can be divided into three categories:

(a) Central

(i) A Cabinet Minister should be designated to speak for science and technology.

(ii) The post of Chief Scientist, CPRS should be developed into a post of Government Chief Scientist, to operate in concert with the Head of the CPRS and the Secretary of the Cabinet.

(iii) ACARD should be developed into a Council for Science and Technology (CST) with a part-time independent Chairman.

(iv) The CST and Government Chief Scientist should co-ordinate Departmental activity more effectively.

(b) Departmental

(i) The Chairman of the Advisory Board for the Research Councils (ABRC) should also function as Chief Scientist, DES.

(ii) Departmental Chief Scientists should clarify their role in policy-making and shed responsibilities for R and D management.

(iii) Certain Departments should create Chief Scientist posts or upgrade existing ones.

(c) Civil Service

The Holgate Committee concepts of Technological Generalists and interchanges within the scientific Civil Service should be pursued more vigorously.

--- A fuller summary of the report's conclusions and recommendations is attached.

3. I have asked Mr A M Fraser (Management and Personnel Office) and Dr R B Nicholson (Chief Scientist, Central Policy Review Staff), consulting other Departments and Chief Scientists as appropriate, to prepare recommendations for the Official Committee on Science and Technology (STO) to advise Ministers on the action to be taken and the reply to be made to the Select Committee. I shall submit the STO's advice and the draft reply to you, copying it to Ministers in charge of Departments, for Ministerial approval. Ministers may be able to clear the Government reply in correspondence; if not, it can go to Cabinet or a Cabinet Committee.

RA

ROBERT ARMSTRONG

8 January 1982

HOUSE OF LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

SCIENCE AND GOVERNMENT

The following is a summary of the conclusions and recommendations of the inquiry into the provision and coordination of scientific advice to government.

The aim must be to make the maximum effective use of those who nationally are fully conversant with S and T, have access to someone of technical expertise and can advise opportunities with a ready understanding of the business of Ministers. (4*)

The Committee accept that the present system of scientific advice to the United Kingdom government, is, by chance or design, going quite a long way to meeting the prime objectives. Nevertheless, the Committee share in the widespread feeling of unease about the present system based on concern about quantity and in some cases the quality of scientific advice and the readiness with which it is sought, the channels of communication and the reception of the advice. (6)

The Committee recognised that

- there are strong traditions of non-intervention and decentralisation in British Government;
- ultimate solutions to improve the reception of scientific advice involve education from school onwards and are necessary long-term;
- at the highest levels of policy determination personalities inevitably play a bigger part than structure;
- S & T policy advice and management, of for example R and D programmes, are best kept separate. (7)

CENTRAL STRUCTURE

a. Minister for Science and Technology

The Committee do not support the concept of a separate "Department of Science and Technology" (8)

It is essential that there is a strong voice in Cabinet for S & T ensuring that advice, free from special Departmental interests, is provided for the Prime Minister and Ministers collectively. This could be achieved in one of at least three ways

* Refer to paragraphs in chapter IV of the Committee's report.

- collective briefing, for example by a Chief Scientific Adviser in Cabinet Office, through CPRS or from a central council on S & T;
- by a designated Minister for Science and Technology;
- through the direct action of a Prime Minister appropriately briefed and advised (9)

A Minister for Science and Technology would focus advice but not have executive powers or direct managerial responsibility for S & T or R and D. The Committee believe that Ministers collectively should be enabled to decide whether levels of expenditure of particular branches of S and T are commensurate with the strategic and national importance of the policies they serve, especially where responsibilities or benefits are divided between Departments and agencies. (10)

The Committee believe that a Cabinet Minister should be designated for S and T (in addition to other responsibilities). A case without an advocate is liable to be lost or forgotten. It is preferable that an existing member of the Cabinet should have this responsibility. (11)

b. Government Chief Scientist

The Committee have been impressed by the evidence in favour of a strong central science adviser in the Cabinet Office. They recognise that success in any such post is closely dependent on the personality, abilities, standing and contacts of the person concerned and on his or her formal and informal relations with the Prime Minister and/or Minister for Science of the day and with organs of the Cabinet Office. A Government Chief Scientist should be appointed to operate in concert with both the Head of the CPRS and the Secretary of the Cabinet in bringing forward scientific and technological advice of all kinds to the attention of Cabinet, whether at their behest or on his or her own initiative. The appointment should be at least at Second Permanent Secretary level, for reasons of comparability within the Cabinet Office and other chief scientists, standing and recruitment. (12)

In addition the Government Chief Scientist should help co-ordinate Departmental effort in S and T; encourage the progressive development of concerted programmes of research - civil and defence; provide a focal point for reception of advice to Government and be responsible for developing and implementing international links necessary to support the comprehensive system of scientific advice to government. The Committee recommend accordingly that such a post be established in the near future. (13)

The Government Chief Scientist should work from within the CPRS, filling a double role in concert with both the Secretary of the Cabinet and the Head of CPRS and adequately supported. Whatever the precise arrangements, he or she needs ready and independent access to the Prime Minister. (14)

c. Council of Science and Technology (CST)

Both effective Ministerial review of S and T and strengthened provision of advice to Cabinet collectively by a Government Chief Scientist would be substantially helped by a CST. Accordingly, the Committee recommend the establishment of such a Council (15)

The CST should present an annual "state of the nation" report on S and T to Parliament covering scientific opportunities and implications, resource allocations and the cost-effectiveness of research programmes supported by the public sector, bearing in mind the contribution of the private sector. At a time of financial pressure when Departments defend their own efforts vigorously an independent CST has a key role to play in helping Ministers review and concert the national scientific effort. (16)

At present there is a vacuum at the centre which, for example leaves the work of the Research Councils and universities and the scientific advice thay can provide ineffectively linked with either Departmental policies or with the scientific and technological needs of industry and its contribution to research. The CST ought to fill this gap. It should also act as a spur to high technology transfer from the defence sector into civil industry. (17)

The new Council would need to be carefully constituted, served by a small, full-time secretariat. It should be geared to central machinery but must be encouraged to preserve a healthy independence from it. The Council should have an independent, part-time chairman and should report to the most senior Minister speaking for S and T in Cabinet. The Government Chief Scientist would be a member. (18)

Membership should be drawn from Government, industry, universities, Research Councils and scientific and engineering bodies. It would include the chairman of the ABRC, the chairman of the UGC, one or more Departmental Chief Scientists and an officer of the Royal Society. Links with NEDC and with the Treasury would be desirable. Working Sub-Committees could draw more widely from the scientific community and industry and perpetuate ACARD's achievement in bringing into Government the resources and talents of industry and technology. (19)

The Chairman of CST would need access to Government at the highest level. The CST must have reasonable access to papers prepared in Government and be made privy to normally conventional matters relating to issues it was addressing. (20)

The CST should be regarded as an evolutionary development of ACARD. It should absorb ACARD's functions and take its place. (21)

The ABRC has an essential role in relation to the management of the Research Councils and the Secretary of State for Education and Science's responsibility for the Science vote; and neither the Research Council nor DES would benefit from severing the link between them. While ABRC reports to an executive department it cannot take on the role of CST. ACARD has also done a worthwhile job, provoking public discussion of specific issues relating to the future of British technology, through its series of reports. This job could be done by CST. Increased standing of the new council might encourage the government to take more notice of its advice and some of the drawbacks of a rigid distinction between basic and applied R and D in ACARD's terms of reference could be avoided. CST will range over all S and T with emphasis on advice and the implications of S and T for policies and strategies of Departments and government as a whole. The working relationship should be agreed with ABRC. ABRC should assist in the preparation of the annual report to Parliament. Co-operation with the Royal Society and the Fellowship of Engineering as the principle spokesmen for science and engineering would also be expected. (22)

DEPARTMENTAL RESPONSIBILITIES

a. Advisory Board for the Research Councils (ABRC)

The Committee recommended no change in their ABRC's role in the management of the Research Councils and in advice to DES on that part of science supported by the Science Vote. This educational link must not obscure the relevance of basic research to industrial and other fields of government policy. The Chairman of the ABRC should have a more nearly full-time appointment as well as being a key member of the CST. The Chairman should be invited to perform for DES more of the functions envisaged for Chief Scientists in other Departments. (23)

ABRC and DES should be geared to move faster to meet immediate national needs and pursue the part that universities can play in national issues with scientific content. (24)

b. Chief Scientists

The power and influence of Chief Scientists has declined over the past five years and there has been an erosion and down-grading of the posts which the Committee deplores even though they recognise that the system has not been entirely successful. (25)

The problem of effectiveness is largely because Chief Scientists are too much involved as research managers and too little as policy advisers. Their role is crucial but Departments must take a wider view of that role. They must be integrated into the decision-making machinery and should not be restricted to advising on issues which have a "scientific" aspect. They should steer clear of day-to-day research management problems and avoid being identified as producers of R and D menus. (26)

All Departments concerned with S and T should have Chief Scientists at Deputy Secretary levels or above. (27)

The Secretary of State for Scotland should consider the proposal to establish a Chief Scientist structure in his office. (28)

The Committee regret MAFF's decision to abolish the single Chief Scientist post at Deputy Secretary level and consider that, unless a trial period shows the new structure to be an obvious success, a reversion to a single post at Deputy Secretary level. (29)

R and D Funding: Mechanisms and Principles

There is too rigid a distinction between basic and applied research - with the resulting assumption that the former, however relevant to the development of Departmental policy, has to be funded through the Science Budget of DES. Much strategic research, some applied research of immediate relevance to industry and some research of importance to more than one Department may be endangered for lack of a full assessment of the implications or of overall priorities. (31)

The DOI reorganisation of its Requirements Boards is a much-needed opportunity to develop a more positive line on medium to longer-term areas of strategic applied research and "generic technologies" where initiatives cannot be expected to arise directly from industry. The new structure should point the way to the growth of inter-departmental customer boards and the management of research programmes spanning Departmental interests and responsibilities and to a re-examination of the ratios of Government spending on fundamental research, applied research and all subsequent development phases. (32)

If research contracts are being delayed or vitiated because of unsuitable conditions, these should be considered. (33)

The Departmental Co-ordination

There is little overall co-ordination of scientific effort between DOI, D/Energy and D/Environment. The British Technology Group, NEDC, the Research Councils and the universities could all be involved more closely in co-ordination. (34)

The CST would play a significant role in helping to define an overall government strategy for the support of R and D and in monitoring its success but its management will require a much more constructive use than hitherto of the general machinery for interdepartmental co-ordination. The Committee recommended that the Government give early consideration to how this might best be effected. Co-ordinating machinery at a slightly lower level than the Committee of Permanent Secretaries and Chief Scientists might be more productive. (35)

Two specific aspects of interdepartmental co-ordination relating to the Treasury and to the MOD concern the Committee. In the absence of scientific advisory bodies to the Treasury, the Committee hope that there will be contact between the Government Chief Scientist and the Treasury Minister in weighing the advantages of proposals from a Department against their monetary and economic cost or benefit. (36)

The Committee had not given detailed attention to the relationship between science and government specifically in the role of defence. (37)

Structured co-operation in reviewing, for example, the DOI R and D support progreamme and the MOD programme would be appropriate and the Committee recommend that the Departments for Industry and Energy be represented on the Defence Science Advisory Council. The Government Chief Scientist should have some concern with Defence, at least as far as ensuring links between civil and defence science and their application. (38)

CIVIL SERVICE

a. General Conclusions

The paucity of scientists and engineers coming through as potential Permanent Secretaries is a structural weakness. (39)

There is an overwhelming case for a changed attitude to science and scientists in the civil service and for a higher civil service which makes use of all the talents. (40)

The Committee are convinced that a change of attitude to S and T ought to be induced within the civil service so improving the impact of S and T on industry and society and incidentally increasing the likelihood of more scientists and technologists seeking to contribute to government administration and policy. (41)

It is most desirable that all pupils in schools are at least taught <u>about</u> science and technology and their impact on society. (42)

b. Technological Generalists

The Committee was pleased to note the Government's response to the Holdgate Report and pressed the Government to institute a "technological generalist" scheme as soon as possible. (43)

c. Inter-change

The Committee accept the desirability, in principle, of an improved mobility of manpower between sectors of employment and periods of secondment are one means of achieving this, albeit on a short-term basis. (45)

It must be made apparent that secondment is in the interests of the employee, that it is likely to lead to career improvement not impairment, and that the scheme is more than cosmetic. (47)

d. External Communication

The Committee are concerned that the channels of communication between government and the general scientific and technological community are inadequate. (48)

The situation has been made worse by the recent reduction of scientific advisory bodies. (49)

The Committee recommend that the Government review their relations with outside bodies in the interests both of improving scientific advice and providing the opportunity for such bodies to offer, and have accepted, unsolicited advice to Ministers and Officials, formally and informally whether or not it is geared to current government objectives or inquiries. (50)

The Committee believe that the Government should review its relations with the engineering profession, inter alia through the new British Engineering Council; consider how it might improve liaison between senior staff and technology advisers in government and technical staff in industry; and promote the dialogue between industry and the academic world on training and research. (51)

The proposed CST should give early consideration to the international aspects of scientific advice to government.(52)

SOME OTHER CONSIDERATIONS

b. Administrative and Financial Effect of Recommendations

An implementation of the report would mean an increased demand on resources, but in relation to the sums dispersed by government in scientific, technical and related matters the extra cost is small and will be more than compensated by the returns from better application of public expenditure. (55)

CONCLUSION

Many of the functions which the Committee have identified as necessary are in fact being carried out by one means or another. The Prime Minister is her own Minister for Science and Technology. Dr Ashworth was less than a Chief Scientific Adviser but he undoubtedly approached the role envisaged by the Committee and his successor's remit and higher rank go some way to acknowledge this. The Committee are not content that all functions of CST are carried out at present but they note a tendency of ACARD to interpret its terms of reference as widely as possible. This is one area where positive change is required.(56)

The suspicion between the scientific community and the Administrative Civil Service is very disturbing and must be dispelled. In the short term, mobility in and out of the Civil Service and more positive career management for scientific civil servants will bring immediate gains and the government have a good opportunity in their discussions and action on the Holdgate Report. But effective action is needed to improve the climate of scientific and technical advice.(57)

Parliament
File AH

10 DOWNING STREET

From the Principal Private Secretary

SIR ROBERT ARMSTRONG

The Prime Minister was grateful to you for drawing her attention, in your minute A06272 of 10 December 1981 to me, to the report of the House of Lords Select Committee on Science and Technology.

FAW.

14 December 1981

AH

2.

Prime Minister.

The conclusions of the Select Committee are on page 32 (flagged).

Ref: A06272

MR. WHITMORE

MS.

The Chairman of the House of Lords Select Committee on Science and Technology has asked me to let the Prime Minister have the attached copy of the Select Committee's Report on Science and Government.

2. I shall be submitting in due course a summary of the Committee's conclusions, and recommendations for action and for the Government's reply.

RA

Robert Armstrong

10th December 1981

* HC 20-I (1981)

nr

Prime Minister 4

Here is a report on the scientific work done under the auspices of the research councils. It makes interesting reading, despite being somewhat densely written.

WR
15/12

DEPARTMENT OF EDUCATION AND SCIENCE
ELIZABETH HOUSE YORK ROAD LONDON SE1 7PH
TELEPHONE 01-928 9222

FROM THE SECRETARY OF STATE

Michael Scholar Esq
Private Secretary
10 Downing Street
LONDON SW1A 2AL

10 December 1981

Dear Michael,

I wrote to Tim Lankester on 13 October promising a paper for the Prime Minister on recent developments in science. I am now able to let you have that paper.

When giving it to the Prime Minister, it might also be helpful if she had the copy of my Secretary of State's letter of today's date to the Chancellor of the Exchequer concerning the SSRC.

You have already seen this.
WR

Yours sincerely

Pete Shaw

P A SHAW
Private Secretary

RECENT DEVELOPMENTS IN SCIENCE

Note by the Department of Education and Science: November 1981

THE AGRICULTURAL RESEARCH COUNCIL (ARC)

A Novel Approach to Vaccine Production

1. Research at the Animal Virus Research Institute and Houghton Poultry Research Station offers the exciting prospect of using harmless bacteria present in farm animals to produce a continuous supply of immunogens against virus diseases. At present vaccines to protect animals against virus diseases are costly to produce and stringent safety precautions are necessary. The new approach involves cloning the viral genes which control the synthesis of the proteins conferring immunity and incorporating these genes in harmless bacteria which inhabit the sites of infection in the respiratory and alimentary tracts of animals. The genes would then express themselves in their bacterial hosts by producing the required proteins, thus creating a continuous 'internal vaccination' of an animal by its normal microflora.

A Biotechnological Route to Ammonia Production

2. The reliance of British agriculture on artificial fertilizers from fossil fuels is a matter of concern. Fundamental research led by Professor W D P Stewart FRS, University of Dundee (who has won an international reputation for his research on nitrogen-fixing organisms) and supported by the ARC aims to study ways in which the nitrogen-fixing properties of cyanobacteria (blue-green algae) might eventually be exploited as a new source of nitrogenous fertilizer. The major alternatives are to recycle organic nitrogen in the form of manure and sewage and to exploit more fully biological nitrogen fixation. This latter process is carried out by certain bacteria which have an enzyme, nitrogenase, capable of converting nitrogen to ammonia. Of these bacteria, only the cyanobacteria are able to use sunlight as the energy source for the conversion. Professor Stewart has already shown that ammonia can be produced on a laboratory scale from cyanobacteria by sunlight, air and water. The new research will examine the possibilities of using modern biotechnological and genetic engineering approaches ultimately to produce nitrogen fertilizer from cyanobacteria.

Producing Protein from Waste using Earthworms

3. Work at Rothamsted Experimental Station has shown how earthworms might help in disposing of organic waste from farms and cities. Experiments on raising earthworms have demonstrated that they are very efficient at converting organic waste into protein suitable for supplementing animal and fish feed. The organic waste itself is converted into useful soil additives. Even if only 10% of the annual 100 million tons of animal waste and 30 million tons of human sewage were exploited for earthworm culturing, feed protein worth £300M-400M per year could be produced. Land wastage and dumping would decrease. The basic biological processes are now understood on a laboratory scale; further work is needed to develop the technology to a level suitable for on-farm pilot plants. There is good scope for commercial exploitation and industry is already showing an interest.

Expression of Chloroplast Genes from Higher Plants in Bacteria

4. Molecular biologists at the Plant Breeding Institute have recently achieved the first reported expression of plant genes in the bacterium E.coli. The breakthrough occurred in experiments with genes from chloroplast cells of wheat and maize which produce an enzyme essential in photosynthesis. Once the genetic material had been transferred, the plant enzyme became a major product of the bacterium's metabolism. This ability to manipulate chloroplast genes in bacteria opens up many new possibilities. It should now be possible to identify the products of unknown genes more easily and to synthesise and study them. These new opportunities are stepping stones towards the goals of understanding photosynthesis better, manipulating it in new ways so that plants might harness light energy more efficiently, and in the longer term more generally improving crop plants by manipulating a wide range of genes with desirable attributes. The work is part of the ARC's programme of genetic manipulation of crop plants and receives additional support from the British Technology Group (BTG), which was formed by the merger of the National Enterprise Board and the National Research Development Corporation.

THE MEDICAL RESEARCH COUNCIL (MRC)

Molecular Biology and its Application

5. Dr Sanger and his team (Laboratory of Molecular Biology, Cambridge) have used his techniques to sequence mitochondrial DNA. Mitochondria are the 'powerhouses' of the cell and have their own genetic material. Surprisingly, the genetic code in this DNA has been shown to differ from that in nuclear DNA, hitherto believed to be universal.

6. Modern techniques of molecular and cell biology are being increasingly and profitably applied to the development of improved and novel vaccines against infections: important examples are malaria, schistosomiasis, herpes, poliomyelitis, Epstein-Barr virus, whooping cough, leprosy, rabies, hepatitis and cholera, and the bacteria that cause complications in burns and cystic fibrosis.

7. Techniques of genetic and molecular analysis are being used to provide 'libraries' of clones of human DNA for use, for example, as ante-natal diagnostic probes for inherited disease (Mammalian Genome Unit and Clinical and Population Cytogenetics Unit, Edinburgh). Some are already in use (eg for thalassaemia).

8. Recombinant DNA techniques have been used successfully to insert into bacteria both the leucocyte and fibroblast interferon genes (Professor D C Burke, Warwick). An anti-interferon hybridoma (Professor Burke and Laboratory of Molecular Biology) has aroused wide commercial interest and is being exploited through the MRC's relationship with Celltech.

Fertility and the Developing Child

9. That nursing mothers are less likely to become pregnant again has been often dismissed as incorrect, but has recently been confirmed when the baby is fed frequently 'on demand'. This has serious implications for the developing countries, where such frequent feeding - even during the night - is usual and where commercial pressures to bottle feed will lead to increased birth-rates. The nervous and endocrine mechanisms linking suckling and amenorrheoa are now being investigated in detail as a possible source of an improved contraceptive pill (Reproductive Biology Unit, Edinburgh).

10. There is renewed interest in the question whether blood lead levels in children correlate with deficiencies in the development of intelligence. A pilot study suggests a marginal correlation and a more extensive study is now being mounted.

11. The identification of effects of drugs and other chemicals on the developing fetus is of great public concern (eg thalidomide) and commercial importance; this subject of teratology is weak in this country and a major new programme is being planned as a joint venture of the Toxicology Unit and the Laboratory Animals Centre's new Director, Dr Whittingham.

Radiation and Medicine

12. A new Cyclotron Unit being built at the Clatterbridge Hospital, Merseyside, will be able to test whether neutron therapy offers benefits in common tumours. The cyclotron, which is being funded as to capital costs by private charitable institutions and as to running costs by the Council, will also make available in the North-West radioisotopes for medical and other purposes.

13. An alternative approach to cancer therapy is to use drugs to sensitise cancer cells to X-rays. Clinical trials using one such drug - misonidazole - show that the limiting factor is side effects on the nervous system. The mechanism is being analysed and related chemicals synthesised to reduce this toxicity; progress is promising.

14. The existing cyclotron at Hammersmith is increasingly used to make very short-lived isotopes for local use in emission tomography. This new technique allows biochemical defects, eg, in transmitter-binding in areas of the brain, to be localised in the patient and could be of great value in studying objectively and rapidly the effects of drugs on conditions such as schizophrenia.

15. The dangers of low doses of radiation are incompletely understood and are important in establishing safety standards both for the nuclear power industry and for clinical uses of radiation. A study of health and radiation records of all the workers (past and present: some 50,000) in the UK Atomic Energy Authority is well advanced and is to be broadened to include the workers in the Atomic Weapons Research Establishment. These data should establish whether existing safety standards, recently challenged, are significantly in error.

Safety at Home and Work

16. Concern for safety leads to searches for substitutes for those valuable materials, such as asbestos, shown by epidemiological studies to be dangerous. There is thus a need for tests predictive of any hazards associated with novel materials, whether used as substitutes or for new applications. It now seems likely that the hazards of fibrous materials can now be accurately predicted from a combination of their effects on certain cell-culture systems and of their physical properties (Pneumoconiosis Unit, Cardiff).

17. In animals, nitrosamines are known to cause cancer: they are chemicals of common occurrence in foods and, it has been suggested, may be formed in the body, in dangerous amounts after some drugs (eg, cimetidine, used widely to treat stomach

ulcers). It has been found that cumulative exposure to such compounds can be measured by chemical changes they cause in haemoglobin and a study is being mounted to establish the effects of drugs and also to test chemicals (eg, vitamin C) that may block nitrosamine formation (Toxicology Unit).

18. Deep-sea diving is of great economic importance. A limitation is neurological effects of high pressure, but work supported by the MRC showed that some anaesthetic gases will ameliorate these effects while the high pressure itself reduces the effects of the anaesthetic. Nitrogen is used in practice, but the margin for error is small. Work at the Clinical Research Centre has recently shown that some analogues of non-inhaled anaesthetics are active in preventing neurological symptoms and are themselves not anaesthetics.

19. The Trauma Unit (Manchester) have shown that hypothermia is a serious complication in accident victims (especially in the elderly) and have demonstrated the benefits of wrapping patients in metallised blankets and giving them warmed and humidified air to breathe.

THE NATURAL ENVIRONMENT RESEARCH COUNCIL (NERC)

20. The sciences of the natural environment are buoyant because of the growing interest in discovering more about the resources of our planet and because of the new research tools that have become available in recent years, including remote sensing from satellites, deep drilling under deep oceans and advanced methods of data processing.

Earth Sciences

21. The theory of plate tectonics which governs all modern thinking on geology and geophysics arose from research in the deep oceans. Some of the most important work relating to such features as the mid-Atlantic ridge and hot vents at sea have been explored in the international phase of Ocean Drilling, carried out by one specially equipped ship under United States leadership with five other participating countries, amongst them the UK represented by NERC. A new drilling tool for investigating the sediments up to 200 metres deep on the floor of the oceans has greatly contributed to our understanding of the variations of climate during the past two million years. The continental areas of the world are not nearly so well understood and major enterprises in the UK (co-ordinated by NERC and involving universities and Institutes) are studying the exceptionally interesting areas of

Scotland where one of the main geological features (the Scottish Highland Fault, running from Inverness to Fort William) was discovered a century and a half ago but investigations of how it arose require studies of the deeper geology only now becoming possible.

22. NERC's expertise in defining areas where hydrocarbons might accumulate and where useful minerals might be found has sharply increased and is in use both in the UK and under contract elsewhere. Scientists have established unique new methods of analysing systems of fine cracks commonly found in the deep rocks (three thousand m. and below) which may hold valuable clues for earthquakes and their possible prediction as well as for the potential exploitation of geothermal energy from the universally-present hot dry rock. Much progress is also being made in studying the stability of underground layers, particularly its possible disturbance by radio-active waste with its associated heat production.

23. The geology of Antarctica is only now reaching the point where it can be studied in depth. This is important both for the early history of the continents and for exploitation of Antarctic resources. The British Antarctic Survey (BAS), a component of NERC, is active here.

The Marine Environment

24. Techniques have now become available for studying life in the deep ocean several thousand metres down. The work of the Institute of Oceanographic Sciences carried out from RRS Discovery has led to the discovery of new species and the unexpected occurrence of little known animals in great abundance. These include rare fishes, unusual sea squirts in thousands, and previously undescribed protozoons.

25. The relative infertility of much of the world's ocean has long been unexplained. The combination of incident solar radiation, warmth of water and the presence of nutrients is pretty rare; but in UK waters tidally stirred waters impinge directly on relatively still waters where the surface layer can get quite warm. The use of satellite images in conjunction with shipborne observations by NERC's Marine Biological Association has led to the discovery of complex physical boundaries in the ocean between areas of mixed and unmixed water where productivity is exceptionally high. A number of such boundaries or fronts have been mapped in the English Channel, the Western Approaches, and on the regions of the shelf break.

Virology

26. Viruses offer new possibilities for the control of insect pests, as the NERC Institute of Virology has demonstrated in trial controls of the Pine Beauty Moth and Pine Sawfly in Scottish forests. The next stage is the development of insect cell lines and testing systems for the bulk reduction and quality control of such viruses. New work on the nature of latent virus infections suggests that means may be found to activate them as pest control mechanisms.

Ionosphere

27. The Halley Base in Antarctica, operated by BAS, is ideally suited for studies of the ionosphere and the interaction between the solar "wind" and the earth's magnetic field. An understanding of the phenomenon associated with this interaction is of basic scientific interest and of value in communications. An Advanced Ionospheric Sounder has recently been installed at Halley and is now providing a complete description of ionospheric echoes as a function of frequency and time for study by scientists from BAS and universities.

Land Use

28. A number of techniques have come together, partly depending on remote sensing from satellites and partly on refined instruments developed by the NERC Institute of Hydrology, to study water in the ground and its evaporation. The effect of afforestation on the use of upland areas for water catchment is an active research topic leading to new possibilities for multi-purpose land management. The Institute has developed a system for the rapid characterisation of vegetation and land use which is now finding wide application in land use planning, classification of soils, and forestry development. The methods are also used by NERC's Institutes under contract to study foreign regions.

THE SCIENCE AND ENGINEERING RESEARCH COUNCIL (SERC)

Particle Physics

29. Perhaps the most intellectually exciting of contemporary scientific developments is the move towards a unified theory uniting the four fundamental forces now known to exist in Nature - gravitation, the electromagnetic force of Faraday and Clerk Maxwell, and the "strong" and "weak" nuclear interactions identified by modern physics. A development in that direction was the formulation of a theory uniting the "weak" force with electromagnetism for which Professor Salam of Imperial College

shared a Nobel Prize in 1979. Particle physics owes much to the close interaction of theory and experiment, and the demands of experimental particle physics have now reached a stage at which equipment is so costly and so complex that it can only be provided on an international scale. At CERN UK physicists are heavily involved in the quest for the quantum of the weak nuclear force, the parallel to the photon of electromagnetism; and the Super Proton Synchrotron, CERN's most powerful accelerator, will be used to produce this quantum directly in proton - anti-proton collisions. The Large Electron Positron collider (LEP) which among other things will permit detailed study of the weak quantum, is expected to be commissioned in 1987. UK scientists from universities and the SERC's Rutherford Appleton Laboratory are extensively involved in its planning. UK workers are also active at European laboratories in testing the predictions of quantum chromodynamical theory that strongly interacting particles like the proton are made of simpler entities called quarks and gluons.

Astronomy and Atmospheric Physics

30. UK astronomers are studying space from the bottom of the earth's atmosphere to the most distant limits of observation, studying celestial phenomena throughout the electromagnetic spectrum. Because the earth's atmosphere is opaque to much of the spectrum, spacecraft and balloons are essential to their work.

31. The United Kingdom Infra-red Telescope in Hawaii, which recently became operational, is the largest instrument in the world dedicated to infra-red observations. Its size, coupled with the high sensitivity of its detectors, have made it possible to observe the most distant galaxies and quasars known in the infra-red band. Rapid variations have been observed in the intensity and polarisation of extreme active galactic nuclei which has provided fundamental information about physical conditions close to what is probably a massive black hole. Studies of compact binaries have enabled the primary component of dwarf novae to be detected and give information on the dynamics of matter as it accretes from the cool star to the compact object. Infra-red observations of faint stars have led to the reliable determination of the numbers of the faintest stars, and have resulted in the discovery of the faintest star known.

32. The SERC plays an important part in the European Incoherent Scatter Scientific Association, whose headquarters are in Sweden, which has installed and recently begun to operate an incoherent scatter facility, consisting of two high powered radar installations, in the study of the scattering of radio waves from free electrons in the upper atmosphere. Last July the first measurements of signals scattered from

different heights were received, and electron densities, temperatures and ion temperatures are now being measured.

33. It is now well established that there are large holes in the distribution of galaxies in the Universe which have been found both by plotting the distribution of galaxies on the celestial sphere and by measuring the recession velocities of bright and faint galaxies. The pattern of their distribution is akin to filamentary structures, with very little between the filaments: the structure could be thought of as roughly resembling a large sponge. This picture of the distribution of galaxies imposes new restraints on admissible theories of galaxy formation. UK workers at Durham University and the Royal Observatory, Edinburgh are pursuing these studies to observations of much larger regions of the Universe than have previously been studied.

Atomic and Molecular Structure Studies

34. The SERC's synchrotron radiation source at Daresbury was commissioned in August 1981 and has already provided data on the surface structure of semi-conductors, the structure of platinum-based anti-cancer drugs and the topography of silicon, diamond, beryl and other crystals. At the SERC's Central Laser Facility at the Rutherford Appleton Laboratory, recent work on laser-plasma interaction and laser compression has included the development of X-ray shadowgraphy techniques and their use in the study of the dynamics of imploding targets. The extension of laser studies to shorter wavelengths would open up important new areas, and work at the University of Hull is directed towards the development of an X-ray laser. Much remains to be done before an engineered instrument can be made, but good progress has been made towards the demonstration of laser action at wavelengths much shorter than have previously been achieved.

35. Nuclear magnetic resonance (NMR) spectroscopy has long been an essential tool for the chemist, and now provides a non-destructive, non-invasive way of studying at the molecular level the biochemistry of living systems of interest to the MRC as well as the SERC. Work by Dr G K Radda and his colleagues at Oxford involves the study by NMR methods of the muscle, brain, heart and kidneys of intact laboratory animals. The development of the high-field spectrometers necessary for this work has been carried out in association with a local company, the Oxford Instruments Group, and because of its clear potential for clinical applications a new company, Oxford Research Systems, has recently been formed, with the assistance of BTG specifically to market these instruments for biological and clinical applications.

36. Another striking example of the study of biological systems by physical methods is the work of Sir David Phillips and his colleagues at Oxford on X-ray studies of enzyme action. The aim of this work is to gain a fuller understanding of the function of proteins through a precise definition of their structure. The information obtained is not confined to the static arrangement of atoms: evidence on the apparent motion of the atoms is also derived which can be interpreted in terms of the dynamic properties of the molecules. In 1980 the structures of eight proteins were resolved by Professor Phillips's team to resolutions as high as 1.7Å. The molecule of one protein studied, phosphorylase b, contains 7000 independent atoms and the process of structure refinement involved 35000 reflections. Thirty years ago the Annual Reports of the Chemical Society referred to the X-ray analysis of a structure containing 100 atoms made possible by the computational techniques then becoming available. Professor Phillips's work of today makes extensive use of the vector processing computer now installed at SERC's Daresbury Laboratory, a machine embodying recently developed computer architecture which he regards as having opened up new possibilities for the calculation of accurate models of proteins and their ligand complexes.

Technological Applications of Science

37. Current studies of Langmuir-Blodgett monomolecular films provide an example of the application of classical work to contemporary technology. In carefully controlled conditions, perfectly-formed insulating Langmuir-Blodgett layers may be deposited on the surface of semiconductors. Silicon is effective in microelectronic devices because of the natural oxide which forms an insulating layer. The use of Langmuir-Blodgett films opens up the possibility of many other, more efficient semiconductors in applications that might include transducers and solar cells.

38. The SERC has recently initiated a new programme of robotics research, which has led to the development at Nottingham University of prototype software for the computer simulation of industrial robot installations. Work at Sussex University aims at the construction of computational models of language understanding, including fundamental perceptual studies of the interaction between speech and rhythm, and the automatic generation of highly intelligible speech. It is a striking example of the way in which the development of computing equipment and computing software has in recent years made entirely new areas accessible to the methods of exact science.

38a. To help to exploit scientific and engineering developments for biotechnology the SERC has established, jointly with DOI, a new Biotechnology Directorate whose Director took up his full-time post last week; and the Research Councils have established a Co-ordinating Committee to draw together their numerous activities in this field.

Occupational Stress

39. It has been reported from a number of studies that different occupational groups show different levels of mental and physical health. However, in these studies it is difficult to distinguish between effects associated with pre-existing differences between those who enter different occupations, and effects due to the nature of the work environment and job demand in different occupations. Hence it has not been possible to establish definitively that the work environment to which individuals are exposed can influence well-being. This difficulty was eliminated in the design of a study (Occupational Stress - A Longitudinal Approach, by Drs Katharine Parkes and Michael Argyle of the Department of Experimental Psychology, University of Oxford) based on the systematic pattern of ward allocations undertaken by student nurses, which provided an unusual opportunity to compare the effects of different work environments on the same individuals.

40. The results showed that differences between medical and surgical wards significantly affected several measures of well-being, especially depression, anxiety and work satisfaction; while male and female wards gave rise to differences in work satisfaction and in anxiety. Further analysis indicated that these differences in well-being were associated primarily with differences in the extent to which the work was perceived as skilled, creative and allowing opportunities for decision-making, and with differences in the level of social support in the work environment. This study thus demonstrates that the work environment can influence mental health and well-being, and identifies some important mediators of these effects, which have general implications for job design and work organisation.

Population Forecasting

41. When the number of births in a population changes sharply, this may be due to a move towards larger or smaller family sizes or to alterations in the intervals between births. The Centre for Population Studies at the London School of Hygiene, whose work SSRC supports, has just devised an effective method of distinguishing between these two factors by using the series of births by order in the family per year, and measures of first and second births by marriage duration. The measures come from routinely published registration data.

42. The most important practical application of this method is the forecasting of future births from the series of past births per year by birth order, which takes account of family size and of changes in the interval between births (factors whose

longer term effects are very different). The issue is critical for population forecasting in this country at present.

Decision Analysis

43. Decision Analysis aims to organise and systematise thinking about different courses of action that can be pursued in a complex decision. It seeks to do this around three dimensions: assembling and defining the available options, assessing the levels of uncertainty about the possible outcomes from each possible action, and deciding the value or worth to be put on the various outcomes. When decisions become complex people find it difficult to grasp them comprehensively. Decision Analysis provides a framework within which this can be done.

44. Its procedures have been used in a wide range of problems. In the private sector a motorcar company had to decide whether or not to move out of a particular market; the choice was whether to introduce a new product to replace an old one or to continue with the old product which was threatened by competing technology and a possible legislative ban. A service company wanted to decide where, and at what level, a new service should be test marketed. An oil company had to decide whether or not to bid for drilling rights in a certain area of the North Sea, and the size of its bid, taking into account future uncertainties about costs, yields of oil, future prices and taxation arrangements.

45. In the public sector alternative methods for safeguarding the security of raw nuclear materials and by-products have been appraised. Other examples include looking at water supply problems, contingency reserves planning, and weapons procurement.

THE BRITISH MUSEUM (NATURAL HISTORY) (BM(NH))

46. The BM(NH), which celebrates its centenary at South Kensington this year, is one of the world's major taxonomic institutions, housing a unique collection of reference items, approximately 50 million in number and increasing at the rate of 1% per annum. Its naming and classification work help to underpin development of the agricultural, environmental and medical sciences.

47. The major part of the Museum's resources (80%) support its scientific work, of which the following examples are of special significance:

(a) The disease schistosomiasis, caused by a worm-like parasite, affects approximately 200 million people in Africa, Asia and South America. A clear understanding of the taxonomy of the parasite is a prerequisite

to its control. Scientists at the Museum, designated a 'Collaborative Centre' by the World Health Organisation, are using a range of biochemical techniques including the separation of enzymes by electrophoresis to elucidate the taxonomy of the parasite and its snail intermediate host.

(b) BM(NH) scientists are also studying some non-parasitic groups of worm-like animals, namely nematodes, which are of world-wide importance in the breakdown of organic material. This study is typical of the traditional approach to taxonomy, ie the detailed microscopic study of external characters. The first priority is the production of a British marine nematode handbook, needed by ecologists.

(c) Detailed taxonomic accounts of bloodsucking flies that carry human disease, eg mosquitoes and blackflies, have been produced by Museum staff. Some of these flies are now known to be complexes of species that look alike but that differ in their biology. Diagnosis and identification of the members of such complexes is a prequisite to an understanding of their roles in disease epidemiology. Current work is concentrated on sandflies that carry leishmaniasis in Central and South America, and blackflies that carry 'river-blindness' (onchocerciasis) in Brazil and West Africa.

48. Twenty per cent of the Museum's resources support the presentation of natural history to the visiting public, now numbering approximately three million each year. The BM(NH) was given (i) the National Heritage Museum of the Year Award for 1980 - the first time the Award has been given to a national museum, and (ii) a special commendation in the competition for European Museum of the year 1980.

DEPARTMENT OF EDUCATION AND SCIENCE

ELIZABETH HOUSE, YORK ROAD, LONDON SE1 7PH

TELEPHONE 01-928 9222

FROM THE SECRETARY OF STATE

Tim Lankester Esq
Private Secretary
10 Downing Street
LONDON SW1

13 October 1981

Dear Tim,

HOUSE OF LORDS SELECT COMMITTEE SUB-COMMITTEE ON SCIENCE AND GOVERNMENT.

When Mr Macfarlane talked recently with the Prime Minister about Science he undertook to let her have notes on the work of this Committee and on recent developments in science.

On the former I enclose a short summary of the main themes covered in the published evidence. May I stress that we do not claim it to be authoritative. It was prepared originally for our own internal briefing. Moreover there is a volume of written evidence, possibly large, given to the Committee in response to the circulated questionnaire (copy also enclosed) which is not available to us, not having been published.

Mr Shelton has been invited to appear before the Sub-Committee on 21 October with Sir James Hamilton; they have sent us a number of questions (copy also enclosed) which show something of the drift of their thinking.

We are preparing for you a short paper on recent developments in science which I will send as soon as possible.

Yours sincerely

Peter

P A SHAW
Private Secretary

HOUSE OF LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

(SUB-COMMITTEE I - SCIENCE AND GOVERNMENT)

BRIEF SUMMARY OF MAIN POINTS EMERGING FROM EVIDENCE TO THE SUB-COMMITTEE

1. MACHINERY OF GOVERNMENT

About half of those giving oral evidence favoured the reconstitution of some form of Central Science Committee (CSC); and most supported the re-creation of a Chief Scientific Adviser (CSA) post, to advise the Prime Minister and Cabinet specifically on scientific matters and to co-ordinate policy formulation and oversight. They did not see a need for a change in Ministerial responsibilities for science, or for the creation of a Minister for Science and Technology; but several witnesses qualified their support for a CSA and CAC upon evidence of their acceptability to Government and the Prime Minister. The adviser should work closely with (if not actually within) CPRS and should be of at least Deputy Secretary rank: this person and the CSC should be involved in the co-ordination of general Science and individual Departments' policies, the identification of priority areas in R and D and the allocation of resources. Several witnesses felt that a new CSC might be based on a previous body such as the Central Advisory Council on Science and Technology or ACSP; this would need to be privy to confidential Government matters if it were to be effective.

2. CHIEF SCIENTISTS

Apart from the need identified above, it was generally felt that the Chief Scientist post at CPRS should be retained, but preferably, and along with all other Chief Scientist posts, at Deputy Secretary level. The problems that Chief Scientists face in reconciling their roles as research budget managers with their policy advisory duties were noted, but most of those interviewed felt that Chief Scientists should be more fully involved in policy formation and implementation within their Departments than they appeared to be. Occasional meetings between Chief Scientists of different Departments to discuss mutual and overlapping policies were recommended. (CVCP suggested a panel of part-time consultants from industry and the universities who could supply Chief Scientists with up-to-date technological advice.) The idea of part-time Chief Scientists was put forward.

3. ABRC

ABRC was seen to be preoccupied with the division of the Science Budget; it had not devoted sufficient attention to the broader aspects of civil science. It was suggested that ABRC's terms of reference might be extended to enable it to play a

fuller role in advising Government and that it should work more closely with ACARD. It was also felt that the Chairman (and members) should devote more time to ABRC business, and that more industrial representation on the Board was needed.

4. DUAL SUPPORT SYSTEM - SUSR

While expressing support for the dual funding arrangements whereby the basic facilities for research are provided by the universities and the Research Councils offer selective support for specific research projects, the CVCP and UGC (and Sir Alec) expressed concern about the viability of the system in the light of recent reductions in university funding: serious damage would be caused because of the rapid time scale of the cuts. It was emphasised that both parts of the system needed to be adequately funded: it was not enough simply to protect the Science Budget. Reference was made to the Joint ABRC/UGC Working Party on the dual support system, and the awaited report of its findings.

5. ACARD

Witnesses thought that although ACARD had produced reports of a very high quality, Government response to and action on these reports had on the whole been disappointing.

6. ADMINISTRATION

The need for more scientific civil servants to move into administration and policy making was identified; improvements in the career development and training of scientific civil servants were required. Freer traffic of staff between the Service, the universities and industry was advocated.

7. INTERNATIONAL SCIENCE

It was generally felt that more scientific counsellors and supporting staff were needed in our embassies.

SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

SUB-COMMITTEE I - SCIENCE AND GOVERNMENT

SOME QUESTIONS FOR WRITTEN EVIDENCE

A. Machinery of Government

1. Should scientific advice and/or research procurement be a distinct function of Government separate from the existing Departmental structure?

2. How successful is the system of Departmental Chief Scientists in procuring advice, managing research and influencing policy.

3. How well supported are Ministers when judging scientific priorities in decision making, particularly if Government Departments are not in agreement?

4. How far is the scientific advice sought by Government geared to supporting predetermined objectives?

B. Finance

1. How satisfactory is the division of financial responsibility between the Research Councils (as a group) and Government Departments funding research on the customer/contractor principle?

2. Is any research which could be of real value to Government being neglected for lack of identified customers or because it is peripheral to the interest of several customers; if so, what changes could rectify this?

3. Are any changes in research budgets desirable?

C. Machinery of Science

1. How adequate are the channels of communication from the scientific community to Government, and vice versa?

2. Is there satisfactory contact between those administering science in higher education, industry, the Research Councils and Government?

3. How could statutory procedures for consultation by Government in scientific matters be improved?

4. Are existing sources of advice adequate to ensure that the UK gains all it can from EEC and international research programmes?

D. Scientific Manpower

What manpower constraints are there on the provision of scientific advice to Government?

SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

SUB-COMMITTEE I - SCIENCE AND GOVERNMENT

Questions for the DES

1. Is "Department for Education and Science" something of a misnomer? Is the Department more a Ministry for the Research Councils?

2. What part does DES play in Departmental coordination of scientifically-based policy? How do you ensure that the policy of Government as a whole, or other Departments, takes account of the contribution of

a) basic science
b) Research Councils
c) universities and polytechnics

3. One of the terms of reference of ACARD is 'the articulation of applied R & D with scientific research supported through DES'. On the other side of the coin, how does DES articulate scientific research which it supports with applied R & D?

4. Do you agree with Sir Alec Merrison's description of the ABRC as a huge torpedo not being launched at anything very much? Do you have any proposals for making it more active?

5. What is the staff supporting ABRC?

6. The following appears in the DES press release announcing the Expenditure White Paper 1981/82 to 1983/84: "The plans allow for provision for science to be held broadly at the current level throughout the period. It should thus be possible for the Research Councils ... to maintain their selective support for research in universities and polytechnics at broadly the current level at a time when provision generally for higher education is planned to decrease".

a) Do you agree that this indicates a failure to appreciate the importance to basic science of the dual support system?

b) Ought not the Chairman of the ABRC to have been consulted before the cuts were made?

7. Why does DES have no Chief Scientist?

8. Who is Head of Profession for scientists in DES?

9. Does DES take people on secondment from universities, Research Councils, research institutions etc.?

10. a) What are your proposals for increasing science in the school curriculum? Are they likely to produce more scientists and technologists?

b) Are there any plans for extending the arts element in the education of scientific and technical specialists?

11. Particularly at a time of cuts in educational expenditure, how does DES assess industry's need for trained manpower? Does DES or DoI have the prime responsibility for ensuring that universities etc. are producing the requisite manpower?

cc Mr. Whitmore

Parliament

PRIME MINISTER

House of Lords Select Committee on Science and Technology: Enquiry into Science and Government

Ian Bancroft and Robert Armstrong are coming in tomorrow afternoon to talk about the evidence which they and others are to give to the Lords Select Committee on Science and Technology, on the provision and co-ordination of scientific advice to Government.

You might like to look back at your letter to Ian Lloyd of 20 August 1979, a copy of which is attached. You will remember that you said in it that you would yourself play a co-ordinating role on issues where it would not be sensible to ask any other Minister to take the lead. In practice, I cannot recall a single scientific issue where you have found it necessary to take such a co-ordinating role yourself. I also attach some Answers you gave in the House in 1979, to Tam Dalyell and Ian Lloyd. As far as I know, these are your only public pronouncements on this subject.

MS

16 February 1981

Despatched in Islay DS A

cc DES
CO
CDL
LPO
D/EN
D/IND

CSD (MG) Division
Mr. Noel Thompson
(Cabinet Office)

Noted a/c

20 August 1979

Dear Ian,

Thank you for your letter and enclosures of 24 July about the administration of science policy.

You will remember that your point was extensively debated here in the early 1970s. In fact there was then a more centralised science budget than there is now. I was responsible for a budget of £200 million (about 1971) which was allocated among the four research councils. But the centralised system was not considered satisfactory.

Our system was given its present shape by the 1972 White Paper "Framework for Government Research and Development" (Cmnd. 5046). The main features are that the Department of Education and Science is responsible for the Research Councils and for funding fundamental research through the Science Budget, the Department of Industry has responsibility for the support of industrial technology, and each major Department is responsible for the determination, financing and exploitation of its own programmes of applied research and develoopment in furtherance of its policy objectives on the "customer-contractor" principle. These arrangements were reviewed by the last Government. The result of the review was published in March this year as a White Paper (Cmnd. 7499).

Our system recognised that Government-sponsored applied science and technology is not an end in itself, but a means of helping to achieve the Government's policies and objectives. It follows that policy on applied science and technology in

/any

any sector should be associated with policy on investment, human resources, market needs and other factors, and should therefore be the concern of the Minister responsible for overall policy in that sector. But there is one sector - fundamental research - where there is no close link between research and policy. For that it makes sense to entrust responsibility to the Minister who is responsible for those institutions of higher education where much of this type of research is done. Incidentally - our own system was very much admired by all our European colleagues. I met the European Commissioners for Science but can only say they added nothing to what was already being done by other means of callaboration.

If we went over to a centralised system with a separate Minister for Science with his own department we would have to accept the disadvantage of divorcing those responsible for applied R & D from those concerned with formulating and implementing the policies to which their R & D related. In fundamental science we would have an unwelcome division between responsibility for higher education and for the scientific community supported by the Research Councils.

At present we have machinery to ensure that there is no harmful overlap between Departmental R & D programmes and policies, that no gaps arise, that policy questions with a major scientific or technological content are considered interdepartmentally, where this is necessary and that the quality and direction of R & D in any area, or over all areas, can be assessed. Since 1976 a committee of permanent secretaries and chief scientists has provided interdepartmental co-ordination of science and technology matters at high official level; and the Central Policy Review Staff play anaactive part in the overview aspect. In addition to numerous informal contacts, formal committees for interdepartmental co-operation are established when appropriate, e.g., the Committee of Chief Scientists on Energy Research and Development and the

/Interdepartmental

Interdepartmental Co-ordinating Committee for Scientific and Technical Information. The membership of the Advisory Board for the Research Councils includes Departmental Chief Scientists, the Heads of the Research Councils and independent members. It is therefore well composed to consider and advise on broad scientific issues within its terms of reference, as well as advising the Secretary of State for Education and Science on the distribution of the Science Budget among the Research Councils.

I note your view that we need for Britain a report on the organisation of our science and the resources that go into it on the lines of what the French are doing. I should like to consider in due course whether such a report would be valuable, seeing that the question of organisation was recently covered by Cmnd. 7499. The Research Councils and several Departments publish annual reports on their R & D, and it may take some time to digest the implications of the reduction in public expenditure to which we are committed. But I am quite sure that we do not need a Minister for Science to prepare such a report: this would be feasible under our present system.

I am not saying that our present system should never be adapted. On the contrary, I intend to keep an eye on how it is and modify it as may be required. I recognise, for example, that under the present arrangements issues may arise which straddle the responsibility of several Ministers to such an extent that it would not be sensible to ask one of them to take the lead. In such a case I would myself play a co-ordinating role; I would also, where this was appropriate, answer questions in the House on broad Scientific and technological issues involving several Departments.

Personally I was very sorry that the House decided not to re-establish the former Select Committee on Science and Technology. I thought it did valuable work and was

/complementary

complementary to the role of departments. But you and I were overruled by the vote - however much we both regret it.

(Sgd) Yours ever,

MARGARET THATCHER

Ian Lloyd, Esq., M.P.

Friday 26 October 1979

(Answered by the Prime Minister on 29 October)

UNSTARRED NO. 100 Mr. Tam Dalyell: To ask the Prime Minister, which Minister or Ministers are responsible for science policy, specifying their responsibilities in detail.

My right hon. Friend the Secretary of State for Education and Science takes the lead on science policy issues arising out of his responsibilities for the Research Councils (on which he is assisted by my hon. Friend , the Member for Sutton and Cheam); the universities; and other parts of the education system.

Ministers in charge of other departments are responsible for policy in connection with research and development within their own areas of concern, In appropriate cases I would play a co-ordinating role myself.

12 July 1979

OFFICIAL REPORT: VOLUME 970 COLUMN 660—661

SCIENCE AND TECHNOLOGY

Q4. **Mr. Ian Lloyd** asked the Prime Minister if she will appoint a Minister of Cabinet rank with specific responsibility for the overall co-ordination of science policy.

The Prime Minister: I do not consider that such an appointment is necessary. There is already full consultation between the Ministers and Departments concerned.

Mr. Lloyd: Although all Members of Parliament assume that my right hon. Friend's sympathies are with the importance of science, is she aware that within the OECD area there are 10 countries which appoint a Minister of Cabinet rank with specific responsibility for science and technology? Is she further aware that if we are to meet our energy aims and ambitions, that will depend entirely upon the scientific and technological community? Can she give it some encouragement that the Government agree with that view?

The Prime Minister: The person who has most responsibility for the future of science and technology is my right hon. and learned Friend the Secretary of State for Education and Science. There is a junior Minister who is responsible for science education. I do not think that it would be an advance to appoint a specific Minister for science and technology. Attention to scientific and technological matters should run through each and every Department, and should not be allocated to one specific Department.

Mr. Frank Allaun: Reverting to the question of science, will the Prime Minister say where and when she received a mandate for the figures revealed today which show that a housewife who paid £25 last month for her groceries now pays £28·25?

Mr. Speaker: Order. That comes under the open type of question. That is stretching imagination beyond even what a Welshman can take.

BF 16.2.8

lady

10 DOWNING STREET

N. Whitmore

Set up for
1700 on
Tuesday 17 Feb.
any further
briefing required?

CD.

10/2.

MS 10/2

No.

10/2

10 DOWNING STREET

From the Principal Private Secretary

SIR IAN BANCROFT

House of Lords Select Committee on Science and Technology: Enquiry into Science and Government

I have shown the Prime Minister your minute of 6 February about the enquiry into the provision and co-ordination of scientific advice to Government which the Lords Select Committee on Science and Technology are undertaking.

She agrees that it would be useful if you had a word with her to clear the line you should take when you give oral evidence on 25 February, and we will be in touch with your office to arrange a time.

I am sending copies of this minute to Mr. Buckley, Sir Robert Armstrong, Sir James Hamilton, Mr. Ibbs and Dr. Ashworth.

9 February 1981

I'll return to me yrs

discussion.

MW

Clive MW. I've mentioned this exchange (briefly) to the DES Under Secretary who is preparing a draft memorandum on a similar subject to the Commons Select Cttee. I'll let you see that draft; I hope before the Bancroft meeting. MS

10 DOWNING STREET

With the compliments of
Mr. C. A. WHITMORE

Prime Minister.

Agree to see Sir Ian Bancroft to discuss the general line he should take in giving evidence to the Select Committee?

Yes

6.iii.81.

MR C A WHITMORE

HOUSE OF LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY: ENQUIRY INTO SCIENCE AND GOVERNMENT

The Lords Select Committee on Science and Technology has set up a Sub-Committee, under Lord Sherfield, to consider the provision and co-ordination of scientific advice to Government. The Sub-Committee have formally invited me to give oral evidence to them on 25 February.

2. They want to question me primarily about the machinery of government aspects of the provision and co-ordination of scientific advice and the part that advice plays in support of the objectives of departments. This is, of course, a perfectly legitimate line of enquiry and one on which they are entitled to seek evidence from the Government. There is no alternative for me but to agree to appear before the Sub-Committee; and this I have done. Naturally, however, I shall confine my answers to questions about the present machinery of government arrangements and not express any personal views on possible future developments. In the short time available, it would not be possible to prepare and clear with all concerned a written memorandum for submission to the Sub-Committee before my appearance in front of them: they have not asked for one: and, in any event, I think it would be better tactically not to put in a written memorandum at this stage.

3. The Sub-Committee will be inviting other Permanent Secretaries and Chief Scientific Advisers to give oral evidence subsequently. Sir Robert Armstrong, Sir James Hamilton, Mr Ibbs and Dr Ashworth are among those who are likely to receive invitations.

4. Work has already begun on the preparation of general briefing about the need for scientific advice and the arrangements for its provision and co-ordination. It will, of course, take account of the correspondence in the summer of 1979 between the Prime Minister and Mr Ian Lloyd about the administration of science policy. It will also take account of Lord Todd's ideas on the subject, which he outlined in his address to the Royal Society on 1 December 1980. He is a member of the Sub-Committee.

5. The Sub-Committee are bound to be interested in the Prime Minister's views on this subject because of her correspondence with Mr Lloyd and her well known interest in science policy. Anything to do with the machinery of government invariably raises wide Parliamentary and Press interest. It would be useful therefore, to clear with the Prime Minister the general line I might take in giving evidence; and I think this might best be done in the course of a brief discussion with her if one can be fitted in during the week before 25 February.

6. I am sending copies of this minute to the Lord President, Sir Robert Armstrong, Sir James Hamilton, Mr Ibbs and Dr Ashworth.

IB

IAN BANCROFT
6 February 1981

FROM THE EARL FERRERS (ACTING LEADER)

Parliament
2 pps MS

FROM THE LEADER OF THE HOUSE
HOUSE OF LORDS

29 January 1980

Dear Francis,

Thank you for your letter of 22 January in which you were kind enough to agree that it would be inappropriate to seek particular qualifications to the broad terms of reference of the new Committee.

The House agreed to appoint a "Select Committee on science and technology" on 23 January. The Committee of Selection has met and it will propose the following names to the House. Lords Caldecote, Cranbrook, Bessborough and Lucas of Chilworth (Conservatives); Lords Brown, Gregson, Shackleton and Lady Jeger (Labour); Lords Avebury and Lloyd of Kilgerran (Liberals); and Lords Todd (proposed Chairman), Ashby, Adrian, Schon and Sherfield (Cross Benchers). The necessary motion will be tabled when the report of the Committee of Selection has been published.

I agree entirely, of course, that Lords Committees should be treated on the same terms as Commons Committees. I shall write to the Committee on Science and Technology in due course and I will make available to them the revised Memorandum of Guidance. I shall of course be happy to provide what help I can should the Committee indicate any intention of working in areas which touch on defence. In the meantime, as you suggest, it will be sufficient to wait to see the shape of the Committee's programme of work.

I am copying this letter as before.

Yours ever,
Robin,

FERRERS

The Rt Hon Francis Pym, MP
Secretary of State for Defence

SECRETARY OF STATE

WITH

THE COMPLIMENTS OF THE

PRIVATE SECRETARY

MINISTRY OF DEFENCE, WHITEHALL

LONDON, S.W.1A 2HB

With apologies for the delay in preparation

30.1.80

The following image type has poor quality text due to the nature of the material.

Image quality is best available.

MINISTRY OF DEFENCE WHITEHALL LONDON SW1A 2HB

MO 21/8/4

22nd January 1980

Dear Ri

LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

Thank you for your letter of 15th January.

I entirely take your point that if the terms of reference are to be of a general character as you forecast, it would be inappropriate to seek particular qualifications. But, as explained in my earlier letter of 16th November to Christopher Soames, I would be reluctant for practical reasons to see the Committee's activities touch on the Defence field, particularly in the near future, and I should be grateful for your continued help in this respect.

On the other hand while, as you suggest, there could be security difficulties in particular defence areas, the point should not be overstressed. The new Select Committee on Defence in the Commons will, like its predecessor, be granted access on a strictly need to know basis up to the level of Secret, and I believe that if the Lords Committee were at some stage to seek evidence from my Department, you would not wish me to do less for them. This would be in line with Annex C of the attachment to Paul Channon's letter of 21st December which, I note it, you will be making available to the Lord's Committee in due course. On this basis, the line suggested in your letter is too restrictive.

Yours [illegible]

I suggest therefore that it might be best to let matters lie until the Committee have decided what their programme of work should be.

I am sending copies of this letter to those who received copies of yours.

Yours ever

Francis

Francis Fym

With the compliments of the

Private Secretary to the Leader of the House

and the Chief Whip

House of Lords

NBPM

NJS

FROM THE EARL FERRERS (ACTING LEADER)

Parliament

FROM THE LEADER OF THE HOUSE

HOUSE OF LORDS

15th January 1980

Dear Francis,

LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

In your letter of 16th November to Christopher Soames, you expressed reservations about the terms of reference of the proposed Lords Committee on Science and Technology.

The House has now agreed to a recommendation from the Procedure Committee to set up a Select Committee on science and technology, but the terms of reference have not yet been tabled. Those peers, who are actively interested in the new Committee, hope that the terms of reference will be agreed shortly. The House, and those who particularly support the establishment of the Committee, will expect them to be "to consider Science and Technology".

Whilst I entirely understand, and sympathise with, your view that it would be inappropriate for a Lords committee to start ferretting around in a sensitive area, it would be unusual in this House to make specific exclusions. I am sure that it would be considered unacceptable for the Lords committee to have narrower terms of reference than the former Commons committee. Indeed, I fear that such an attempt might even be resisted on principle, and successfully, by peers voting on a non-Party basis. Lords Committees are, however, usually keen to develop good working relations with Government Departments and they are generally tactful and sensible in the use of their terms of reference. I should be happy to write to the Chairman of the new Committee, who is expected to be Lord Todd, President of the Royal Society, to suggest that a procedure be adopted under which the Leader of the House would write to the Chairman to notify him if the subject matter of a proposed enquiry in the defence field touched on highly classified defence research and development. The Leader could indicate that the Government would be unable to give the Committee information on matters affecting national security. This would be in line with the Crossman letter of 1967 referred to by the Home Secretary in his letter of 10th January 1980 to Paul Channon.

repeated

The Rt Hon Francis Pym, MP
Secretary of State for Defence

/...

FROM THE EARL FERRERS (ACTING LEADER)

FROM THE LEADER OF THE HOUSE

HOUSE OF LORDS

In his letter of 21st November 1979 to the Chancellor of the Duchy of Lancaster, Christopher Soames undertook to consult with Lord Shackleton and Lord Sherfield who proposed the committee to the Procedure Committee, with the usual channels and with the Chairman of Committees. I have done so on his behalf and I have found that their views are very similar to my own and to those of the Lord President, which I have summarised. I hope, therefore, that you would be able to feel content with these arrangements.

I should perhaps add that the new Committee's activities will, in any case, be circumscribed by the decision of the House that initially it should have the services of only one Clerk to cover its work and the work of any Sub-Committees which it may appoint.

I am copying this letter to the Prime Minister, members of Legislation Committee, Sir Ian Bancroft and Sir Robert Armstrong.

Yours ever,

Robin.

FERRERS

The Rt Hon Francis Pym, MP
Secretary of State for Defence

Parliament

V
MS

PRIVY COUNCIL OFFICE
WHITEHALL LONDON SW1A 2AT

Chancellor of the Duchy of Lancaster

28 November 1979

Dear Christopher

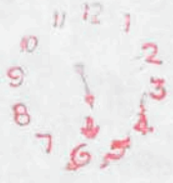
You wrote to me recently about the Lords Procedure Committee decision in favour of a Select Committee on Science and Technology.

As I said in my letter of 15 November, I would not object to this, provided colleagues who are departmentally concerned are content. It is reassuring to know that the Procedure Committee have agreed not to pursue the experimental Select Committee on the lines of recommendation 16 of the First Report of the 1976-7 Ad Hoc Committee. This could have been much more difficult from a Commons viewpoint.

I am copying this to the recipients of yours.

Yours ever,
Jim

The Rt Hon Lord Soames, GCMG, GCVO, CBE
Lord President of the Council
Civil Service Department
Old Admiralty Building
Whitehall
SW1



With the compliments of the

Private Secretary to the Leader of the House

and the Chief Whip

House of Lords

✓

MS

Parliament

FROM THE LEADER OF THE HOUSE
HOUSE OF LORDS

November 1979

Dear Norman,

The Procedure Committee have agreed not to proceed with an experimental Committee on the lines proposed in Recommendation 16 of the first report of the Practice and Procedure Committee (Session 1976-1977). They have agreed instead to the Shackleton/Sherfield proposal to establish a Committee on Science and Technology.

Colleagues have expressed concern that the proposed Committee will overlap with the new Commons Committees. I accept that we do what we can to avoid duplication of work. On the other hand, the new Commons Committees will cover the work of all the main Government Departments and this could be used as a reason for opposing the appointment of most Lords Committees. I think that the Lords European Communities Committee has demonstrated that Lords' Committees have a role and can complement those of the Commons, even when they are working in the same field. Science and technology is not the responsibility of any one Commons Committee and many Peers feel that a Lords Committee on the subject would be worthwhile for that reason. Moreover, there are some 80 Peers with knowledge of the field of whom 13 are Fellows of the Royal Society.

I should expect the House to agree to a recommendation from the Procedure Committee that a Committee on Science and Technology should be established as soon as practicable. Francis Pym expressed concern about the inclusion of defence research in the Committee's terms of reference. I shall consult the usual channels and Lords Shackleton and Sherfield on this point and write to colleagues when I have done so. The view of the Procedure Committee was that the new Committee should be set up as soon as staffing and accommodation considerations permitted. At present, it appears unlikely that the Committee could begin work before Easter 1980.

The Rt Hon Norman St-John Stevas, MP
Chancellor of the Duchy of Lancaster

/.....

FROM THE LEADER OF THE HOUSE

HOUSE OF LORDS

I am sending copies of this letter to the Prime Minister, Members of Legislation Committee, the Secretary of State for Education and Science, the Secretary of State for Defence, the Secretary of State for Industry, the Secretary of State for Trade, the Secretary of State for Energy, the Minister of Transport, Sir Robert Armstrong and Sir Ian Bancroft.

Yours ever

Christopher

The Rt Hon Norman St-John Stevas, MP
Chancellor of the Duchy of Lancaster

cc LCO
LPO
LPSO
SO
WO
GCWO
LOD
FSO, HMT
CWO, Lords
LAD
CO

Parliament

10 DOWNING STREET

From the Private Secretary

19 November 1979

Proposed Lords Select Committee
on Science and Technology

The Prime Minister has seen your letter to me of 13 November. She is very much in favour of the proposed Select Committee.

I am copying this letter to Private Secretaries to the members of Legislation Committee and to Martin Vile (Cabinet Office).

MJS

Charles Cumming-Bruce, Esq.,
Chief Whip's Office.

Parliament

V MS

MINISTRY OF DEFENCE WHITEHALL LONDON SW1A 2HB

TELEPHONE 01-218 9000
DIRECT DIALLING 01-218 2111/3

16th November 1979

MO 21/8/4

Dear Christopher,

Thank you for sending me a copy of your letter of 14th November to Mark Carlisle. Your timescale has not permitted as careful consideration of this proposal as I should have liked, but I set out below my initial reactions.

I must say that I have certain misgivings about the proposal to set up a functional committee in the Lords when we are to have Departmentally related committees in the Commons. There seem to me to be dangers of overlapping and conflict here which deserve careful consideration before we commit ourselves. Moreover, at a time when we are seeking to achieve substantial economies in the running of Departments I am sure we should look very closely at proposals which are likely to result in an increase in administrative workload.

From a Departmental point of view I see potential difficulties about the inclusion of defence matters within the scope of a Science and Technology Committee. Defence research and development is very closely related to the defence equipment programme and much of the work is of course classified. This raises issues which I think need to be considered carefully before any decision is taken to include defence within the Committee's scope. In the short term too, there is the difficulty that as part of the programme of economy measures which I have instituted in the MOD, Euan Strathcona is currently undertaking a comprehensive review of research and development activities in the defence field. I would not wish a Select Committee to set up an inquiry in this area until such time as our own review is complete.

/ I ...

The Rt Hon The Lord Soames GCMG GCVO CBE

I am sending copies of this letter to recipients of yours.

Francis Pym

PRIVY COUNCIL OFFICE
WHITEHALL. LONDON SW1A 2AT

Chancellor of the Duchy of Lancaster

VMS

15 November 1979

Dear Christopher.

COMMITTEE STRUCTURE IN THE HOUSE OF LORDS

You wrote to me on 12 November about the proposal from Lord Shackleton and Lord Sherfield for a Lords Select Committee on Science and Technology, and I have now seen your further letter of 14 November.

My main concern is of course with any possible repercussions on our room for manoeuvre in dealing with the outstanding Commons Procedure Committee proposals, and more generally on the implications for the passage of Government legislation. I am therefore glad to know that you are intending to resist the proposals in recommendation 16 of the First Report of the Lords Ad Hoc Select Committee on Practice and Procedure, Session 1976-77. As regards a Lords Select Committee on Science and Technology, I would certainly not object to this - subject to the views of the Secretary of State for Education and Science and of other colleagues who may be departmentally concerned - and I agree that it might be useful in its own right and that our acceptance of the proposal might be a helpful indication of a constructive attitude in the context of the discussion on recommendation 16.

I am copying this to the recipients of your two letters.

Yours ever

The Rt Hon Lord Soames
Lord President of the Council
Old Admiralty Building
Whitehall

DEPARTMENT OF EDUCATION AND SCIENCE

ELIZABETH HOUSE, YORK ROAD, LONDON SE1 7PH

TELEPHONE 01-928 9222

FROM THE SECRETARY OF STATE

✓ MS

15 November 1979

The Rt Hon Lord Soames PC GCMG GCVO CBE
House of Lords
LONDON SW1

Dear Christopher,

COMMITTEE STRUCTURE IN THE HOUSE OF LORDS

Thank you for your letter of 14 November about the proposed establishment of a Lords Committee on Science and Technology.

Although the papers circulated with your letter suggest that the Committee's main function might be to scrutinise Bills and other proposals, I am assuming that in practice it will operate in much the same way as the former Commons Select Committee on Science and Technology ie that it will examine and report on questions of current interest in the whole area of science and technology.

I think that the creation of such a Committee could be a useful addition to our constitutional arrangements provided that it did not give rise to unnecessary duplication and work. I foresee a serious risk of overlap not only with the work of the Lords and Commons Scrutiny Committees of EEC questions and proposals, where science and technology matters come up, but also with the work of the subject committees which are being set up in the Commons. The latter can be expected to concern themselves with science and technology questions as they examine the work and policies of the departments in their field, simply because science and technology responsibilities are so widely diffused under our system. I think it important therefore that means should be found of ensuring that the proposed Lords Committee avoids this kind of overlap.

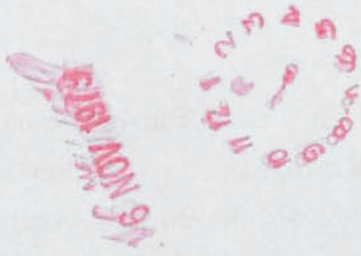
I am bound also to make the point that the creation of the Committee will add to my Department's administrative burden and make it more difficult to pursue the policy, which you are urging on me, of reducing tasks in order to reduce civil service manpower. We really cannot have fewer civil servants while we are creating new work for them to do.

I am sending copies of this letter to the Prime Minister, the Home Secretary, the Secretaries of State for Industry, Defence, Employment, the Environment, Trade, Energy, Social Services, Scotland and Wales, the Ministers of Agriculture and Transport, the Chancellor of the Duchy of Lancaster and Sir Robert Armstrong.

Yours ever

Mark

MARK CARLISLE



DEPARTMENT OF INDUSTRY
ASHDOWN HOUSE
123 VICTORIA STREET
LONDON SW1E 6RB
TELEPHONE DIRECT LINE 01-212 3301
SWITCHBOARD 01-212 7676

Secretary of State for Industry

VMS

The Rt Hon Lord Soames PC GCMG GCVO CBE
Lord President of the Council
House of Lords

15 November 1979

Dear Christopher.

Thank you for sending me a copy of your letter of yesterday to Mark Carlisle about your proposal to suggest at the meeting of the Procedure Committee on 20 November that a Select Committee on Science and Technology should be appointed in the House of Lords. In the time available I can give you only a snap reaction.

The proposal is unwelcome. The disappearance of the House of Commons Select Committee on Science and Technology means that this subject area will be covered by the new departmentally-related Select Committees. It is to be expected that this Department will continue to be involved in inquiries in the science and technology field undertaken by the new Industry and Trade Committee, and if we also have to cope with inquiries initiated by a separate subject Committee in the House of Lords, the net result is likely to be an addition to our workload. There will be in addition an obvious danger of overlap. However, I realise that it would be difficult to resist the current pressure for establishing a Science and Technology Committee and if you and our other colleagues feel that the course of action you propose is the best way of bowing to the inevitable, I do not dissent.

I am sending copies of this letter to the recipients of yours.

Yours
Keith

With the compliments of the

Private Secretary to the Leader of the House

and the Chief Whip

House of Lords

FROM THE LEADER OF THE HOUSE
HOUSE OF LORDS

14 November 1979

Dear Mark,

COMMITTEE STRUCTURE IN THE HOUSE OF LORDS

On 20 November, the Lords' Procedure Committee will be considering Select Committee structure. It is already clear that there will be strong pressure for the Government to support the establishment of a Committee on Science and Technology. The background to this is set out in my letter of 12 November to the Chancellor of the Duchy of Lancaster. That letter should also, of course, have been copied to you and the other recipients of this one and I am, therefore, hastening to let you and our other colleagues know the position and how I propose that it should be handled.

Time is now pressing and I should be grateful, therefore, if you and our colleagues would let me know by tomorrow evening if you and they are content with the course of action I am proposing.

I am sending copies of this letter, and the enclosures, to the Prime Minister, and to the Secretaries of State for Defence, Industry, Trade, and Energy and to the Minister of Transport as the Ministers with the primary concern with science and technology. Copies of this letter only are being sent to the Chancellor of the Duchy of Lancaster and to Sir Robert Armstrong for information.

Yours ever

Christopher

SOAMES

The Rt Hon Mark Carlisle
Secretary of State for
Education and Science

(15) While the use of Public Bill Committees would improve the quality of the legislative work of the House, the function of a Public Bill Committee would most profitably be performed within the context of the new committee structure summarized in Recommendation (16) below. (*Paragraph* 38.)

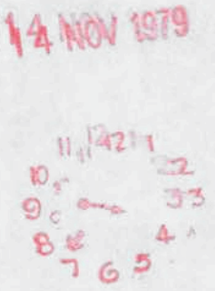
(16) There should be a number of Select Committees, matching policy areas, which would scrutinize Bills and other proposals within the relevant area. All Public Bills, except where otherwise ordered, should be considered by one of these Committees both in the manner of a Select Committee and in the manner of a Public Bill Committee; Commons Bills should be referred to the appropriate Committee after Second Reading in the House of Commons. Initially a small number of such Committees might be set up as an experiment. The Procedure Committee, or a sub-committee of that committee, should consider the detailed implementation of the scheme. (*Paragraph* 52.)

House of Lords

SELECT COMMITTEE ON PRACTICE AND PROCEDURE

The First Report of the Committee was published on 26th April 1977 and was debated on 5th July 1977. The motion before the House was to take note of the Report, but an amendment was tabled inviting the House to agree that "one or more Select Committees matching policy areas" should be established in order to scrutinise Bills and other proposals as proposed in Recommendation 16 of the Report. The Leader of the House, Lord Peart, secured withdrawal of the amendment by agreeing to set up an experimental Committee to test the proposals in Recommendation 16. As a result, the matter was then referred to the sessional Procedure Committee.

When the matter was considered by the Procedure Committee, the Leader of the House raised a number of detailed objections to the proposals. In particular, he argued that the procedural difficulties involved were sufficiently serious as to make a substantial part of the recommendation impracticable. The Procedure Committee set up a Sub-Committee to consider in detail how the experimental Committee could be set up to consider Public Bills falling within a particular policy area. On 26th July 1978 the Procedure Committee considered the Sub-Committee's Report and decided that no action should be taken until the House of Lords had had an opportunity of studying the proposals made by the Commons Procedure Committee which had not reported at that time. This postponement of consideration was challenged in the House, and the Chairman of Committees gave an assurance to the House that the matter would be considered at the next meeting of the Procedure Committee. This meeting takes place on 20th November.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PRIME MINISTER

This is interesting - and, in my view, welcome. Content to give it your blessing?

MJS
14/xi

FROM THE PRIVATE SECRETARY TO THE LEADER OF THE HOUSE
AND THE CHIEF WHIP

13th November 1979

Yes - very much so MT

Dear Nick,

PROPOSED LORDS SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

In view of the Prime Minister's correspondence in August with Ian Lloyd on the administration of science policy, I enclose a copy of a letter from the Lord President to the Chancellor of the Duchy of Lancaster seeking his agreement and the agreement of colleagues on Legislation Committee to the line he proposes to take in a meeting of the Lords Procedure Committee on 20th November.

The Procedure Committee will report to the House on the proposal by Lords Shackleton and Sherfield that a Select Committee should be set up in the House of Lords on Science and Technology. It is likely that the Procedure Committee will make a recommendation in favour of the new Committee, and it will be a matter for the House to decide.

The Lord President is personally in favour of the Committee being established. He also attaches considerable importance to securing a recommendation to the Procedure Committee that an experimental Committee previously under discussion should not be established, as it could lead to a number of permanent Committees being set up which could extend the time required to get legislation through the House of Lords. The proposal for an experimental Committee has a considerable history, on which I can provide you with further information if required.

Yours ever,

Charles Cumming-Bruce.

C.H. CUMMING-BRUCE

N.J. Sanders, Esq.
Private Secretary
10 Downing Street

FROM THE LEADER OF THE HOUSE
HOUSE OF LORDS

12 November 1979

Dear Norman,

COMMITTEE STRUCTURE IN THE HOUSE OF LORDS

Lord Shackleton and Lord Sherfield have proposed that a Select Committee on Science and Technology should be appointed in the House of Lords. The proposal has already attracted considerable support, particularly among members of the Parliamentary and Scientific Committee which includes members of both Houses.

The matter will be considered by the Procedure Committee on Tuesday 20th November when I propose to suggest that the Committee on Science and Technology should be established as an alternative to the experimental Committee previously under discussion. The latter Committee was intended to test the proposals in Recommendation 16 of the First Report of the Lords ad hoc Select Committee on Practice and Procedure (HL 141, Session 1976/77, copy of Recommendation 16 attached), and was regarded as the precursor of a new Committee structure in the Lords, consisting of a number of permanent Committees matching policy areas. The background to consideration of Recommendation 16 is summarised in the attached note. Unless I have heard to the contrary by 14th November, I will take it that I have your agreement and the agreement of colleagues to the course of action I have proposed.

I am sending copies of this letter to members of Legislation Committee and to Sir Robert Armstrong.

Yours ever

Christopher

The Rt Hon Norman St-John Stevas, MP
Chancellor of the Duchy of Lancaster

Recommendation 16

(15) While the use of Public Bill Committees would improve the quality of the legislative work of the House, the function of a Public Bill Committee would most profitably be performed within the context of the new committee structure summarized in Recommendation (16) below. (*Paragraph* 38.)

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With apologies for omission
from letter of 14.11.79

With the compliments of the

Private Secretary to the Leader of the House

and the Chief Whip

House of Lords

FROM THE LEADER OF THE HOUSE

HOUSE OF LORDS

12 November 1979

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I am sending copies of this letter to members of Legislation Committee and to Sir Robert Armstrong.

Yours ever

Christopher

The Rt Hon Norman St-John Stevas, MP
Chancellor of the Duchy of Lancaster

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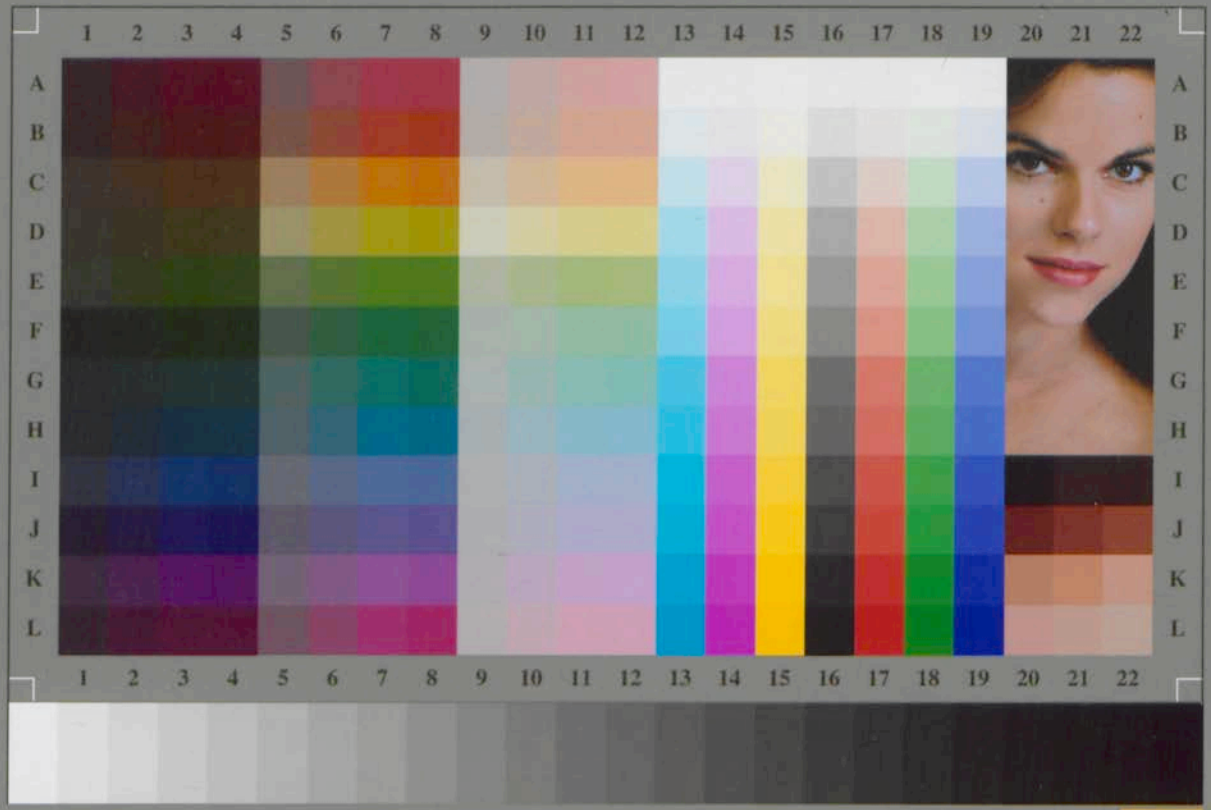

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