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SCIENCE AND TECHNOLOGY
COMMITTEE

Sixth Report

**SCIENCE AND THE COMPREHENSIVE
SPENDING REVIEW**

Report and Proceedings of the Committee

*Ordered by The House of Commons to be printed
18 November 1998*

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SCIENCE AND TECHNOLOGY COMMITTEE

Sixth Report

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The Science and Technology Committee is appointed under Standing Order No 152 to examine the expenditure, administration and policy of the Office of Science and Technology and associated public bodies.

The Committee consists of 11 Members. It has a quorum of three. Unless the House otherwise orders, all Members nominated to the Committee continue to be Members of it for the remainder of the Parliament.

The Committee has power:

- (a) to send for persons, papers and records, to sit notwithstanding any adjournment of the House, to adjourn from place to place, and to report from time to time;
- (b) to appoint specialist advisers either to supply information which is not readily available or to elucidate matters of complexity within the Committee's order of reference;
- (c) to communicate to any other such committee and to the European Scrutiny Committee, to the Committee of Public Accounts, to the Deregulation Committee and to the Environmental Audit Committee its evidence and any other documents relating to matters of common interest; and
- (d) to meet concurrently with any other such committee for the purposes of deliberating, taking evidence, or considering draft reports or with the European Scrutiny Committee or any sub-committee thereof for the purposes of deliberating or taking evidence.

The following were nominated Members of the Committee on 14 July 1997:

Mr David Atkinson	Mr Nigel Jones
Mr Nigel Beard	Dr Ashok Kumar
Dr Michael Clark	Mrs Caroline Spelman
Mrs Claire Curtis-Thomas	Dr Desmond Turner
Dr Ian Gibson	Dr Alan W Williams
Dr Lynne Jones	

Dr Michael Clark was elected Chairman on 30 July 1997.

On 22 June 1998 Mrs Caroline Spelman was discharged from and Mrs Jacqui Lait added to the Committee.

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SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

- (a) We recommend that the Government ensure that the increased emphasis on wealth creation in the allocation of the science budget is not translated into a reduction of the public support given to blue skies research (paragraph 11).
- (b) We congratulate the Government on its response to our recommendations and pay tribute to the Wellcome Trust for its timely and generous commitment to the UK science base (paragraph 13).
- (c) We recommend that the Government monitor the efficiency and effectiveness of both sides of the administration of the Joint Infrastructure Fund so that one side may learn from the other (paragraph 15).
- (d) We recommend that the Government and the Director General of the Research Councils treat the review of funding arrangements as a high priority. In particular we recommend that common transparent accounting procedures are adopted by all universities within the next twelve months to ensure that the full direct and indirect costs of research projects can be identified. We further recommend that when the time comes to determine research council allocations post 2001-02, full provision be made for the Research Councils to pay all the indirect costs of the research they fund in universities without reducing the volume of research they support (paragraph 17).
- (e) We consider that research charities, along with all other non-dual support funders of research, "should be paying for the full economic costs of the research they fund". Thus we still stand by our previous conclusion that while "we do not wish to denigrate the importance of such investment, or to discourage it, we believe that it is primarily the responsibility of Government to fund basic research infrastructure and that research charities should see fully funding the research they commission as their first priority" (paragraph 18).
- (f) We welcome the Government's commitment to funding for the synchrotron beyond the £35 million currently allocated and hope that it is made available as new money (paragraph 19).
- (g) We agree with the Minister for Higher Education that "it is important that [the Government] should not be too intrusive in terms of universities' freedom to spend their money sensibly" but consider that this puts an even greater responsibility on all universities to account transparently for their research income and expenditure and lends more urgency to the studies and reviews of university accounting that are taking place. We welcome the Funding Councils' commitment of £2.8 million to a study designed to identify good practice and offer guidance on costing and pricing to higher education institutions but consider that three years is too protracted a timescale and recommend that the exercise be completed within twelve months (paragraph 21).
- (h) We recommend that departments recognise the importance of maintaining adequate research activities to support their individual policy objectives and that the Chief Scientific Adviser play a strong co-ordinating role across all departments during discussions on departmental research activities (paragraph 23).

SIXTH REPORT

The Science and Technology Committee has agreed to the following Report:—

SCIENCE AND THE COMPREHENSIVE SPENDING REVIEW

INTRODUCTION

1. We firmly held, when we reported earlier this year on funding for university research, that there was “an overwhelming case for a substantial real terms increase in Government expenditure on research” over and above that necessary to make good the existing deficiencies in the science base. By doing so we added our voices to those of many others who had recognised that long-term under-funding was risking the UK’s ability to capitalise on research excellence and had resulted in a crisis in research infrastructure.¹ We will not rehearse here the arguments we made then to justify public support for research:² suffice to say that we agree with John Battle MP, the then Minister for Science, who stated that maintaining and developing the public research base was “absolutely crucial to the future prosperity, development and quality of life of our society”.³ We also accept, in an era of extreme pressure on public funds, that it is no longer possible to sustain the assumption that just because research is a public good, public funds will flow into the science base. Increasing the sum of human knowledge is a noble goal in itself and thus a strong argument for public support for the research base; but the case for Government *investment* must be based in part on the value society can expect to derive from that knowledge, through innovation, wealth creation and improved quality of life, if public spending on scientific research is to retain public consent.⁴

2. We were encouraged by the Government’s reply to our Report in which it stated that “The Government shares the extensive concerns about the funding of research infrastructure and is committed to maintaining and enhancing the excellence of UK research”.⁵ Similarly we were encouraged by other signals from the Government, such as the establishment of the Joint Research Equipment Initiative (JREI) as an annual event; the additional £25 million for teaching and research infrastructure in UK universities in 1997-98 announced in September 1997; and the creation of the University Challenge Fund, in partnership with the Wellcome Trust and the Gatsby Foundation, to assist universities in exploiting science and engineering research outcomes, which was launched in June 1998. Such initiatives were reflected in a number of Ministerial statements, such as the Chancellor of the Exchequer’s Budget statement in March 1998 in which he spoke of “encouraging greater research and development investment” as crucial to job and wealth creation and to achieving higher productivity and the Prime Minister’s statement that the science base was the “absolute bedrock of our economic performance”.⁶ These indicated an acceptance that a world-class science base was crucial to the UK’s future prosperity and international competitiveness. Our Report was, however, purposely made against the background of the then on-going Comprehensive Spending Review (CSR) which we sought to influence. Consequently the Government was not in a position to provide a substantive response to those of our recommendations which entailed significant public expenditure at that time. We, with others anxious over the future of the science base, had to wait for the completion of the CSR and its results which were published in July 1998 in the Government’s White Paper on *Modern Public Services for Britain: Investing in Reform*.⁷

¹ First Report from the Science and Technology Committee, Session 1997-98, on the *Implications of the Dearing Report for the Structure and Funding of University Research*, HC 303-I, para 11. See also paras 19-25.

² *Ibid.*, paras 5-11.

³ HC 303-II, Session 1997-98, Q. 531.

⁴ See Science Policy Research Unit, *The Relationship Between Publicly Funded Basic Research and Economic Performance*, July 1996, p. 55.

⁵ Third Special Report from the Science and Technology Committee, Session 1997-98, *The Government’s Response to the Science and Technology Committee’s First Report, Session 1997-98, The Implications of the Dearing Report for the Structure and Funding of University Research*, HC 799, Appendix, para 3.

⁶ HC Deb, 17 March 1998, c. 1101; *Science*, 21 August 1998, p. 1141.

⁷ *Comprehensive Spending Review: new public spending plans 1999-2002—Modern Public Services for Britain: Investing in Reform*, July 1998, Cm 4011.

3. During the course of this inquiry we have received memoranda and taken oral evidence from Lord Sainsbury of Turville, the Minister for Science, Baroness Blackstone, Minister of State at the Department for Education and Employment (DfEE) with responsibility for Higher Education, the Wellcome Trust and the Office of Science and Technology (OST). We would like to thank all who provided either oral or written evidence. We are also grateful to our specialist advisers for this inquiry: Professor Derek Burke, former Vice-Chancellor of the University of East Anglia and Dr Michael Elves, Director of the Office of Scientific and Educational Affairs at Glaxo Wellcome plc.

4. We are aware that there are sometimes differences in the interpretations which are given to terms such as direct and indirect costs and full economic costs—terms which we have used extensively in this Report. Arguments to support our usage of these terms in respect of the research base can be found in our earlier Report on the *Implications of the Dearing Report for the Structure and Funding of University Research* (paragraphs 24-59).⁸ We are also concerned that there should be no confusion over the precise scope of the term “research infrastructure”. In our use of the term we include standard modern laboratory furnishings and apparatus, major items of equipment, facilities and plant that is required for research in a particular field and that would be expected to be found in a laboratory carrying out research. *We also include premises and their maintenance at an effective level, support (secretarial and technical) staff, libraries and information and communications technology central services.*

THE CSR OUTCOME AND PUBLIC EXPENDITURE ON THE SCIENCE BASE

GOVERNMENT EXPENDITURE ON RESEARCH

5. Government expenditure on civil research comes from three main sources:

- from the Education Departments via the Higher Education Funding Councils (HEFCs);⁹
- from the Science Budget via the OST through central projects and the Research Councils; and
- from individual Government departments which commission or perform research in support of specific policy objectives.

In 1996-97 these three sources respectively accounted for 27%, 35% and 38% of public expenditure on civil science, engineering and technology (SET) which totalled £3,784.6 million.¹⁰ The UK also spends significantly on defence-related research and development (R&D) (see table 1). It is therefore important to consider how the CSR affects each of these sources in any analysis of its overall effect on SET activities.

⁸ *Op. cit.*, *Implications of the Dearing Report*, paras 24-59.

⁹ The “Education Departments” are the DfEE, the Scottish Office, the Welsh Office and the Department for Education Northern Ireland (DENI). The Higher Education Funding Councils are the Higher Education Funding Council for England (HEFCE), the Scottish Higher Education Funding Council (SHEFC), the Higher Education Funding Council for Wales (HEFCW) and the DENI.

¹⁰ *Science, Engineering and Technology Statistics 1998*, p. 4.

Table 1

Government Expenditure on SET prior to the CSR			
Source	% of total 1996-97	% of total 1998-99	planned expenditure 1998-99 (£ million)
Science Budget	21%	21%	1,338
Higher Education Funding Councils	16%	17%	1,077
Direct Funding by other Government Departments	23%	20%	1,304
MoD (defence related R&D)	34%	36%	2,336
(of which: Research Development)	(33%) (66%)	(26%) (74%)	(605) (1732)
Contribution to EU R&D	6%	6%	383
Total			6438

Source: *Science, Engineering and Technology Statistics 1998*, table 2.1.

PLANNED GOVERNMENT EXPENDITURE ON SET AFTER THE CSR

6. The outcome of the CSR for the science budget—that is, that part of Government expenditure set aside for the OST and the Research Councils—was announced on 13th July 1998, a day ahead of the main CSR statement which set out planned public expenditure for the next three years. At the time of the CSR it was stated that delivery of all expenditure plans announced in the CSR was dependent on the economy reaching predicted growth rates as set out in table 2.

Table 2

Predicted Rates of Growth in GDP			
1998-99	1999-00	2000-01	2001-02
1.75%	2%	2.25%	2.25%

Source: *Stability and Investment for the Long Term: Economic and Fiscal Strategy Report 1998*, June 1998, Cm 3978.

These figures have subsequently been revised by the Chancellor of Exchequer but with the commitment that the Government will still “deliver the CSR spending commitments”.¹¹

7. The Government announced that an additional £700 million is to be provided for the science budget, spread over the next three financial years. This represents a real terms increase over three years of some 15% above the 1998-99 baseline funding and is the largest percentage increase any Government department received under the CSR.¹² It was made clear at the time of the CSR that the majority of the increase in the science budget would be channelled through the Research Councils. It was also stated that there would be an increased focus on life sciences research, although precise allocations between the Research Councils and central OST initiatives

¹¹ HM Treasury, *Pre-Budget Report: Steering a stable course for lasting prosperity*, November 1998, Cm 4076, p. 4.

¹² Office of Science and Technology, *Allocation of the Science Budget 1999-2000, 2000-2001, 2001-2002*, October 1998, p. i.

were not announced until October 1998.¹³ The Government also announced a partnership between the OST and the Wellcome Trust in which the Wellcome Trust will contribute, by 2000-01, £300 million towards research infrastructure in universities to match a £300 million contribution from Government, and a further £100 million towards the provision of a new synchrotron in the UK.¹⁴ In addition to the increase in the science budget itself, the CSR provided for an additional £323 million to support research in the UK's universities to be delivered through the Funding Councils, although these funds will cover all areas of research and not just research in SET areas. Together these components result in the headline-grabbing figure of an additional £1.4 billion for science and research over the next three years. (See table 3.)

8. There are several aspects of the overall CSR settlement for science on which we wish to comment in particular. The first is the sheer size of the settlement. Additional Government funding in cash terms for university research over the next three years totals £1.081 billion with a minimum of £728 million being provided for the science base. The bulk of the additional £300 million for research to be provided by the HEFCs is also likely to be spent on SET research: the HEFCs traditionally devote some 85% of all their research funding to SET research and Baroness Blackstone told us that she expected no significant change in this proportion.¹⁵ We are delighted that the Government has been able to follow its positive statements on the important role of the science base with a level of commitment which meets our own recommendation for a substantial and sustained increase in public expenditure.

Component	1998-99	1999-00	2000-01	Total
Government	1,081	1,081	1,081	3,243
HEFCs	728	728	728	2,184
Wellcome Trust	300	300	300	900
Total	2,109	2,109	2,109	6,327

Table 3: Additional Government funding for science and research over the next three years (£ million)

Source: Science, Engineering and Technology Statistics 1998, table 5.3; QQ 99-100.

13 *Ibid.*

14 A synchrotron accelerates charged particles, such as electrons, to speeds close to that of light. A series of magnets is used to bend the path of the electrons into a circular shape. As they pass these "bending" magnets, the path of the electrons is deflected and they emit intense beams of light, known as synchrotron radiation. The spectrum of synchrotron radiation covers part of the electromagnetic spectrum, from infra-red through to gamma-rays. It is used to investigate the structure and properties of all forms of matter. The Wellcome Trust had already committed £10 million to the project thus its total contribution is £110 million.

15 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

16 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

17 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

18 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

19 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

20 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

21 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

22 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

23 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

24 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

25 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

26 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

27 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

28 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

29 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

30 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

31 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

32 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

33 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

34 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

35 *Science, Engineering and Technology Statistics 1998*, p.44, table 5.3; QQ 99-100.

Table 3

GOVERNMENT EXPENDITURE ON SET AFTER THE CSR (£ million, cash terms)						
Government Expenditure	97-98	98-99	99-00	00-01	01-02	Total New Money
Science Budget						
Baseline Funding ¹	1338	1338	1338	1338	1338	
Additional Programmes		25	50	139	194	408
University Challenge			10	10		20
Infrastructure			75	100	125	300
Total Science Budget¹	1338	1363	1473	1587	1657	
<i>Yearly increase in cash terms</i>			8.1%	7.7%	4.4%	
<i>Yearly increase in real terms</i>			7.3%	5.0%	1.8%	
<i>Increase in real terms over 1998-99</i>			7.3%	12.8%	14.9%	
Total increase in Science Budget						728
Higher Education Funding Councils (not all scientific research)						
Extra money for research (England) ²			50	250		300
Extra money for research (Scotland) ³				23		23
Total increase in HEFC research funds						323
Other Government Departments (including MoD)						
Scottish Office (not via SHEFC)				30		30
Other Government Departments (Including MoD)			No announcements yet			
Total increase from other Government Departments						Unknown
Wellcome Trust Funding						
Infrastructure				300		300
X-ray synchrotron				100		100
Total Wellcome Trust Funding						400
Total new government SET Expenditure						1081
Total new SET expenditure						1481

¹ Figures exclusive of receipts to the EU which are £11.1 million in 1998-99 and are planned to be £11.4 million, £11.7 million and £12 million over the successive three years.

² Money from DfEE only to the Higher Education Funding Council for England.

³ Money from the Scottish Office only to the Scottish Higher Education Funding Council.

Priority areas

9. Operating within the context of an enlarged but nevertheless still finite science budget means that the OST has had to make hard decisions about where to direct funding. There is a clear logic behind the increased emphasis on biomedical research, and on meeting the post-genome challenge in particular, which was implicit in the CSR and explicit in the allocation of the science budget. The UK's SET research base excels in these areas, while its pharmaceutical and biotechnology companies have a strong competitive lead and have displayed a willingness to exploit research. As *Nature* noted "economically at least, it makes sense to play to the strongest suit" and we agree that "molecular, biomolecular and biomedical research is an area whose time has come".¹⁶ The OST and the Minister for Science both assured us that the term 'life sciences' should be interpreted broadly. The OST told us that "the biggest priority is ... the post-genome challenge ... That does not just involve work in the life sciences because necessarily that involves physics, chemistry and perversely it even draws in things from particle physics and astronomy and the expertise they have in handling large quantities of data. So life sciences is a shorthand for quite a lot of things".¹⁷ We were pleased that both the allocation of the science budget and the Minister identified a number of other priority areas, including information technology and communications, ageing and quality of life and environmental and climate change research.¹⁸ The increased financial support applied to these priorities puts an even greater responsibility on those working in these areas to ensure that the Government sees a return on its investment.

10. The allocation of new money between the research councils for additional programmes, to a large degree, reflected these scientific priorities (see table 4).

Table 4

Research Council Allocations 1999-99 to 2001-02						
	BBSRC	ESRC	EPSRC	MRC	NERC	PPARC ¹
1998-99	185.739	65.990	382.982	290.208	168.819	97.600
1999-00	198.299	69.754	397.584	304.538	178.530	100.536
<i>Real terms increase 1998-99 to 1999-00</i>	<i>4.06%</i>	<i>3.02%</i>	<i>1.18%</i>	<i>2.28%</i>	<i>2.23%</i>	<i>0.4%</i>
2000-01	202.994	71.174	410.850	319.173	181.757	102.861
<i>Real terms increase 1998-99 to 2000-01</i>	<i>3.92%</i>	<i>2.56%</i>	<i>2.01%</i>	<i>4.58%</i>	<i>2.38%</i>	<i>0.21%</i>
2001-02	208.189	72.901	427.179	334.068	187.457	105.790
<i>Real terms increase 1998-99 to 2001-02</i>	<i>3.98%</i>	<i>2.48%</i>	<i>3.47%</i>	<i>6.79%</i>	<i>3.01%</i>	<i>0.55%</i>

¹ The PPARC allocations shown here reflect only those sums available for domestic research programmes. PPARC also funds some UK subscriptions to international programmes.

11. We recognise that if effort and funding were to be concentrated in a small number of specific areas, selected on the basis of ability to deliver short-term economic benefits, the

¹⁶ *Nature*, 23 July 98, vol 394, p.303. *Op. cit.*, *Allocation of the Science Budget*, p.10.

¹⁷ Q. 2.

¹⁸ Q. 194.

capacity of the UK's researchers to pursue research of a more fundamental, blue skies nature could be limited. Baroness Blackstone, Minister for Higher Education, told us that she would be surprised if vice-chancellors did not choose to use some of the additional money being made available through the HEFCs for blue skies research but that the DfEE would leave such decisions to individual universities.¹⁹ The Minister for Science, Lord Sainsbury of Turville, told us that the increased emphasis on wealth creation need not lead to a lower priority for fundamental research and that he did not expect the balance between public funding for basic research and for applied research to change: "It is probably a mistake to say that if you want to put more emphasis on wealth creation that means one should do more applied research. It seems to me the important thing is maintaining, first of all, the quality of the science base and then making certain that the mechanisms are in place which will make the transfer of knowledge take place."²⁰ We wholeheartedly agree. **We recommend that the Government ensure that the increased emphasis on wealth creation in the allocation of the science budget is not translated into a reduction of the public support given to blue skies research.**

Infrastructure

12. During our inquiry earlier this year into *The Implications of the Dearing Report for the Structure and Funding of University Research* we heard witness after witness telling us that, as a result of long-term under-funding, research infrastructure in the UK's universities was in a "potentially disastrous" or "parlous" state; and many pointed out that this severely undermined the capability of researchers working in universities to attract funding for research from the Research Councils, research charities and industry.²¹ The evidence we gathered was supported by recent studies, such as that undertaken by Policy Research in Engineering, Science and Technology (PREST), which suggested that an investment of between £400 and £500 million was urgently needed to bring research equipment and premises up to standard.²² We concluded at that time that there was "a real and urgent need for the Government to provide additional resources to resolve the immediate crisis in research infrastructure in the UK's universities" and recommended that "the Government allocate a total of between £410 million and £430 million of new money, earmarked for research infrastructure, over the next three public expenditure rounds". We also urged that the issue be "treated with the utmost priority in the Comprehensive Spending Review."²³

13. We are, consequently, delighted with the creation of the Joint Infrastructure Fund (JIF)—a ring-fenced fund for research infrastructure in the UK's universities which will provide £600 million over the next three years. £300 million of the JIF comes from the Government, with another £300 million provided by the Wellcome Trust. The fund will cover all areas of science and engineering encompassed by the remits of the Research Councils and the Wellcome Trust and bids for funding will be accepted from all UK universities which are in receipt of funding from the HEFCs and are associate members of the Committee of Vice Chancellors and Principals. The release of funds from the JIF will take place over 5 rounds with first round funding starting in April 1999. **We congratulate the Government on its response to our recommendations and pay tribute to the Wellcome Trust for its timely and generous commitment to the UK science base.**

14. This arrangement between the Government and the Wellcome Trust represents a novel and perhaps unique public/private partnership. There are, however, some aspects of the JIF that

¹⁹Q. 101.

²⁰Q. 200.

²¹*Op. cit.*, *Implications of the Dearing Report*, para 25.

²²PREST, *Survey of Research Equipment in United Kingdom Universities*, 1996, p. 66. See also HC 303-II, Session 1997-98, p. 113.

²³*Op. cit.*, *Implications of the Dearing Report*, para 35.

warrant closer examination. The intention is that "the proportionate split of the £600 million between the life sciences and physical sciences should depend on the nature and quality of the proposals received".²⁴ Nevertheless, the Wellcome Trust, as a registered charity, cannot spend money outside its charitable objects. This means, as Dr Dexter of the Wellcome Trust told us, that "at least 50% of the Joint Infrastructure Fund will be going to the biomedical sciences" although he also added that 'biomedical sciences' would be "interpreted as flexibly as we are able".²⁵ Sir John Cadogan, the Director General of the Research Councils, emphasised that the £300 million contributed by Wellcome would be the minimum spend on biosciences and that "that could mean that all the rest [ie the Government contribution] goes to biomedical, but it could mean that none goes to it".²⁶ The emphasis on funding for infrastructure for the life sciences in the JIF matches the priorities made clear in the allocations to the Research Councils. Nevertheless, we accept the Minister's argument that "the fact that the first £300 million of bioscience good projects are being taken care of by Wellcome must almost inevitably mean that a lot more will go to the physical sciences than would have gone" without the JIF.²⁷

15. The two streams of funding for the JIF—the Government funds and the Wellcome Trust funds—will be administered through two channels, with bids for funding going either to the Wellcome Trust or the Research Councils. Applications in the biomedical and biological sciences and relevant areas of chemistry will be administered by the Wellcome Trust where they will be assessed by peer review through a newly established International Scientific Advisory Board. Applications in support of all other areas of SET research will be submitted to EPSRC, ESRC, NERC or PPARC as appropriate where they will be assessed under those Research Councils' existing peer review mechanisms. Recommendations from the International Scientific Advisory Board and the individual Research Councils are to be passed on to a Joint Executive Committee (JEC) which will decide which bids will receive funding from the JIF. The JEC is chaired by the Director General of the Research Councils, with the Director of the Wellcome Trust as Deputy Chairman, and includes the chief executives of the Research Councils, senior representatives from the Wellcome Trust and, in a non-voting capacity, the chief executives of the Funding Councils.²⁸ Sir John Cadogan assured us that uniform criteria would be applied to bids by both sides. We note the differences in the procedures to be used by the Research Councils and the Wellcome Trust and **recommend that the Government monitor the efficiency and effectiveness of both sides of the administration of the JIF so that one side may learn from the other.**

16. The funds made available through the JIF over the next three years should resolve the immediate crisis in research infrastructure in universities. Nevertheless, as we argued in our earlier Report, there is also a need to guarantee infrastructure standards in the longer term in order to sustain high-quality research and to ensure that the greatest possible value for money is achieved from the substantial capital investment which the JIF represents.²⁹ We recognise that the failure to make adequate arrangements to meet the indirect costs of research on the part of many of those funding research in universities is one of the causes of the crisis in research infrastructure; and have already made a series of recommendations designed to prevent reoccurrence once the immediate crisis had been resolved.³⁰ Central to this package was the recommendation that the Research Councils should pay the full indirect costs, excluding academic staff salaries, of the research which they fund in universities and that this should

²⁴Q. 152.

²⁵Q. 152.

²⁶Q. 211.

²⁷Q. 211.

²⁸DENI is represented by its permanent secretary.

²⁹*Op. cit.*, *Implications of the Dearing Report*, para 36.

³⁰*Ibid.*, paras 19-25 and 37-59.

include provision for the continual maintenance of infrastructure.³¹ The Government responded that the resource implications were being considered in the context of the CSR.³² The CSR settlement gave no ground on this issue and the then Minister for Science told the House of Commons on 14th July 1998 that "at this stage, there will be no change to the balance of the respective responsibilities for overheads between the funding and research councils".³³ Instead, the Director General of the Research Councils has been tasked with leading a "lengthy and challenging" review of the funding arrangements for university research which will include indirect costs and the level of transparency within university accounting procedures.³⁴

17. It is essential to establish accurately the true costs of research before those costs can be passed onto the Research Councils. We are concerned by a seeming lack of urgency in this regard. Unless robust and transparent financial practices are put in place in all universities to ensure that the indirect costs element of Research Council grants are a genuine reflection of the costs incurred, some of the inadequacies of the present system will persist. This should be done urgently and we see no reason why it should not be possible to achieve within twelve months. If steps are not taken shortly to ensure on-going provision for investment in infrastructure then further capital injections the size of the JIF will be required in future years. **We recommend that the Government and the Director General of the Research Councils treat the review of funding arrangements as a high priority. In particular we recommend that common transparent accounting procedures are adopted by all universities within the next twelve months to ensure that the full direct and indirect costs of research projects can be identified. We further recommend that when the time comes to determine research council allocations post 2001-02, full provision be made for the Research Councils to pay all the indirect costs of the research they fund in universities without reducing the volume of research they support.**

18. The Wellcome Trust told us that, despite its contribution to the JIF and the new third-generation synchrotron, it believes that it is "the responsibility of charities to fully fund the direct costs of the research that they support and ... It is the responsibility of the Government to provide an appropriate base level environment where this research can take place effectively".³⁵ Charities generally pay only the direct costs of the research which they fund in UK universities and make no contribution to the indirect costs of those projects. As we have argued before, **we consider that research charities, along with all other non-dual support funders of research, "should be paying for the full economic costs of the research they fund".**³⁶ Thus we still stand by our previous conclusion that while "we do not wish to denigrate the importance of such investment, or to discourage it, we believe that it is primarily the responsibility of Government to fund basic research infrastructure and that research charities should see fully funding the research they commission as their first priority".³⁷

The Synchrotron

19. The Wellcome Trust's commitment under the CSR of £100 million for a new, third generation synchrotron is additional to the £10 million it had already committed to the project. The Government has set aside £35 million for the synchrotron over the next three years in its science budget allocation but as the total cost of the project is likely to be in the region of £170 -

³¹By 'full indirect costs' we mean all the costs imposed on a university by a particular research project, excluding academic staff salaries.

³²*Op. cit.*, *The Government's Response*, Appendix, para 8.

³³HC Deb, 14 July 1998, c.290.

³⁴Q. 17.

³⁵Q. 136.

³⁶*Op. cit.*, *Implications of the Dearing Report*, para 53. By 'full economic costs' we mean all the direct and indirect costs imposed on a university by a particular research project, including staff salaries.

³⁷*Op. cit.*, *Implications of the Dearing Report*, para 54.

£175 million there is clearly a gap in the current funding provisions. Lord Sainsbury told us there would be further funding from the Government for the synchrotron but not within the period covered by the allocations announced in the CSR.³⁸ **We welcome the Government's commitment to funding for the synchrotron beyond the £35 million currently allocated and hope that it is made available as new money.**

HEFC Funding for University Research

20. The science budget forms only one half of the dual support system which delivers public support for university research. The impact of any increase in the science budget could therefore have been limited by a lack of generosity on the part of the other leg of the dual support system—the HEFCs. We were therefore pleased that the CSR settlement provided for an additional £300 million for the HEFCE and an additional £23.3 million for the SHEFC, earmarked for research. We commented in April that we felt it most appropriate that additional funds to support basic research infrastructure should be delivered via the Education Departments. The Government has chosen to deliver those funds through the JIF mechanism via the OST. While the Government's decision is justified given the involvement of the Wellcome Trust and the new emphasis on priority areas of research, we sought and were pleased to receive assurances from the Minister for Higher Education that the increased prominence of the OST in terms of responsibility for infrastructure would not result in a decline in the current funding for capital projects provided by the Funding Councils.³⁹

21. The DfEE will issue guidance to the HEFCE to the effect that it expects the money it has earmarked for research to be spent on research. Universities, however, receive their funding from the HEFCs as a block grant which includes a component for research (R money) and a component for teaching (T money) and, while major deviations have to be justified, there is no legal requirement to spend R money on research or T money on teaching. **We agree with the Minister for Higher Education that "it is important that [the Government] should not be too intrusive in terms of universities' freedom to spend their money sensibly" but consider that this puts an even greater responsibility on all universities to account transparently for their research income and expenditure and lends more urgency to the studies and reviews of university accounting that are taking place.**⁴⁰ **We welcome the Funding Councils' commitment of £2.8 million to a study designed to identify good practice and offer guidance on costing and pricing to higher education institutions but consider that three years is too protracted a timescale and recommend that the exercise be completed within twelve months.**⁴¹

EXPENDITURE ON SET BY OTHER GOVERNMENT DEPARTMENTS

22. There has been a long-term decline in the amount of research supported by individual departments outside the science budget and the dual support system. In 1986-87 Government departments accounted for 26.9% of all publicly-funded civil SET; by 1998-99 this figure will have dropped to 22%, representing a fall from £1890.3 million to £1236 million (in real terms, base year 1996-97) (see table 5). By far the largest drops have come in the Ministry of Agriculture Fisheries and Food — from 3.5% of all Government civil SET expenditure in 1986-

³⁸Q. 230.

³⁹Q. 106.

⁴⁰Q. 92.

⁴¹QQ. 92-96.

87 to a planned 2% in 1997-98—and the Department for Trade and Industry — from 8.3% of all Government expenditure on SET in 1986-87 to a planned 5% in 1997-98.⁴²

Table 5

Civil SET Expenditure by Government Departments, 1986-87 to 1997-98 (£ million) (real terms, 1996-97 base year)				
Source	1986-87	% of total Government SET Expenditure	1997-98 (planned outturn)	% of total Government SET Expenditure
Ministry of Agriculture, Fisheries and Food	248.8	3.5%	136	2%
Department of Trade and Industry	581.4	8.3%	299	5%
All Government Departments (excluding the science and engineering base)	1890.3	26.9%	1236	22%

Source: *Science, Engineering and Technology Statistics 1998*.

Departments have yet to make announcements regarding their planned expenditure on SET activities over the next three years following the CSR and statements regarding intentions have been few. Although the Scottish Office announced shortly after the CSR an additional £30 million (see table 1), indications from other departments do not look so positive.⁴³ These are important decisions, as Lord Sainsbury stressed, because they represent over a fifth of all Government expenditure on SET: "it is a very considerable sum of money in terms of scientific research done in this country".⁴⁴

23. Defence-related expenditure on R&D has also declined over the last decade both in real terms—from £3056.2 million in 1986-87 to £2143.7 million in 1996-97 (in 1996-97 terms)—and as a proportion of total Government expenditure on R&D but still remains significant. In 1996-97 defence-related R&D accounted for 34% of all Government expenditure on SET. Obviously a further decline in expenditure on either civil or defence-related SET activities by departments would lessen the impact of the hard-won increase in the science budget. It would also have a negative impact on the quality of decision-making within departments and their ability to ensure that their policies are founded on sound scientific advice—an issue to which we shall return in the course of our inquiry into the scientific advisory system. In this context, we welcome the increased emphasis placed on the cross-departmental co-ordinating role of the Chief Scientific Adviser implicit in his partial re-location to the Cabinet Office. **We recommend that departments recognise the importance of maintaining adequate research activities to support their individual policy objectives and that the Chief Scientific Adviser play a strong co-ordinating role across all departments during discussions on departmental research activities.**

⁴² *Science, Engineering and Technology Statistics 1998*, table 2.5; figures for DTI expenditure on SET exclude OST expenditure and Launch Aid.

⁴³ QQ. 197-9.

⁴⁴ Q. 196. See also *Science, Engineering and Technology Statistics 1998*, p. 4, figure 2.1.

R&D EXPENDITURE BY INDUSTRY

24. Domestic industry forms the largest source of funds for expenditure on R&D in the UK. In 1996 the Government spent a total of £4565 million on R&D compared to an industry spend of £6786 million—£188 million of which was spent on R&D performed in universities.⁴⁵ UK industry, however, does not compare well with its major international competitors in this regard. Between 1992 and 1996 UK industry's expenditure on R&D represented 1.03% of GDP compared to equivalent figures of 2% in Japan; 1.54% in the USA; 1.44% in Germany; and 1.14% in France.⁴⁶ Moreover, the overall trend in UK industry's expenditure on R&D since the early 1990s has been downwards (see table 6).

Table 6

Expenditure on Domestic R&D by UK Industry, 1990-1996 (real terms; base year 1996) (£ million)						
1990	1991	1992	1993	1994	1995	1996
7320	6959	7127	7475	7418	6985	6786

Source: *Science, Engineering and Technology Statistics 1998*, p 63, table 6.3.

More recent figures compound the effect of this trend. The CBI's *Innovation Trends* survey revealed a fall in the average level of investment in innovation by firms across a wide range of sectors. Although, as the recent R&D Scoreboard shows, several sectors such as engineering, media and telecommunications have increased their R&D expenditure, those 19 UK companies which appear in the list of the top 300 investors in R&D internationally increased R&D expenditure between 1996 and 1997 by only 5% which is less than half the global average.⁴⁷ Their aggregate R&D intensity (that is R&D as a percentage of sales) of 2.5% is lower than the aggregate R&D intensities of top companies in all other G5 countries.⁴⁸

25. If industry, and through it society, is to capitalize on Government investment in and support for the SET base, it is essential that industry is prepared to perform the research and development needed to translate the output of the SET base into commercially competitive or socially beneficial products and processes. We agree with the former Minister for Science that "No company can expect profits and growth tomorrow without serious investment today, and R&D plays a vital role in enabling companies to release the potential of our world-class science and engineering base to tackle technological, social and economic challenges, develop new methods and generate know-how".⁴⁹ It is therefore of grave concern that UK industry does not compare well with its major international competitors in terms of overall investment in innovation. This is an issue to which we shall return in our current inquiry into Engineering and Physical Sciences Based Innovation when we will also be able to examine any new proposals to stimulate innovation made in the forthcoming White Paper on competitiveness.

⁴⁵ *Science, Engineering and Technology Statistics 1998*, p. 57, figure 6.3.

⁴⁶ *Science, Engineering and Technology Statistics 1998*, p. 73, table 7.3.

⁴⁷ Department of Trade and Industry and Company Reporting: *The UK R&D Scoreboard 1998*, 1998, p. 1.

⁴⁸ *Ibid.*, p. 12, chart 2.

⁴⁹ *Ibid.*, p. 1.

CONCLUSION

26. We are delighted at the outcome of the CSR for the science budget. Nevertheless we do have some areas of concern, especially over the R&D budgets of Government departments other than the OST and DfEE, and urge the OST to take an active role in conveying to departments the importance of, first, obtaining sound evidence for policy and procurement decisions and, second, their contribution to the science base overall. The substantial increase in Government funding for research, and the science base in particular, puts even more responsibility on those who spend the money to account for it properly. We also recognise that, if the UK is to derive maximum benefit from the Government's increased investment in SET, there is a need for industry to commit greater resources to converting the outputs of the SET base into innovative products and processes. We still maintain that Research Councils should pay the full indirect costs of the research they support and that research funders outside the dual support system should pay the full economic costs and urge the Government to reconsider our recommendation. We pay tribute to those in the OST, the DfEE and the Research Councils who must have argued their case extremely well and commend the Government for placing a high priority on science against many other worthy and competing demands. We also appreciate the commitment made by the Wellcome Trust of £400 million over the next three years to support research infrastructure.

GLOSSARY

BBSRC	Biotechnology and Biological Sciences Research Council
CSR	Comprehensive Spending Review
DENI	Department for Education Northern Ireland
DfEE	Department for Education and Employment
EPSRC	Engineering and Physical Sciences Research Council
ESRC	Economic and Social Research Council
HEFCs	Higher Education Funding Councils
HEFCE	Higher Education Funding Council for England
HEFCW	Higher Education Funding Council for Wales
JEC	Joint Executive Committee
JIF	Joint Infrastructure Fund
JREI	Joint Research Equipment Initiative
MRC	Medical Research Council
NERC	Natural Environment Research Council
OST	Office of Science and Technology
PPARC	Particle Physics and Astronomy Research Council
R&D	Research and Development
R money	That part of universities' block grants intended to be spent on research
SET	Science, Engineering and Technology
SHEFC	Scottish Higher Education Funding Council
T money	That part of universities' block grants intended to be spent on teaching

PROCEEDINGS OF THE COMMITTEE RELATING TO THE REPORT

WEDNESDAY 18TH NOVEMBER 1998

Members present:

Dr Michael Clark, in the Chair

Mr Nigel Beard

Mrs Claire Curtis-Thomas

Dr Ian Gibson

Dr Lynne Jones

Mr Nigel Jones

Dr Ashok Kumar

Dr Desmond Turner

Dr Alan W Williams

The Committee deliberated.

Draft Report (Science and the Comprehensive Spending Review), proposed by the Chairman, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 4 read and agreed to.
Paragraph 5 read, amended and agreed to.
Paragraphs 6 to 17 read and agreed to.
Paragraphs 18 and 19 read, amended and agreed to.
Paragraphs 20 and 21 read and agreed to.
Paragraph 22 read, amended and agreed to.
Paragraphs 23 and 24 read and agreed to.
Paragraphs 25 to 27 read, amended and agreed to.

Resolved, That the Report be the Sixth Report of the Committee to the House.

Ordered, That the Chairman do make the Report to the House.

Ordered, That the provisions of Standing Order No. 134 (Select Committees (reports)) be applied to the Report.

The Committee deliberated.

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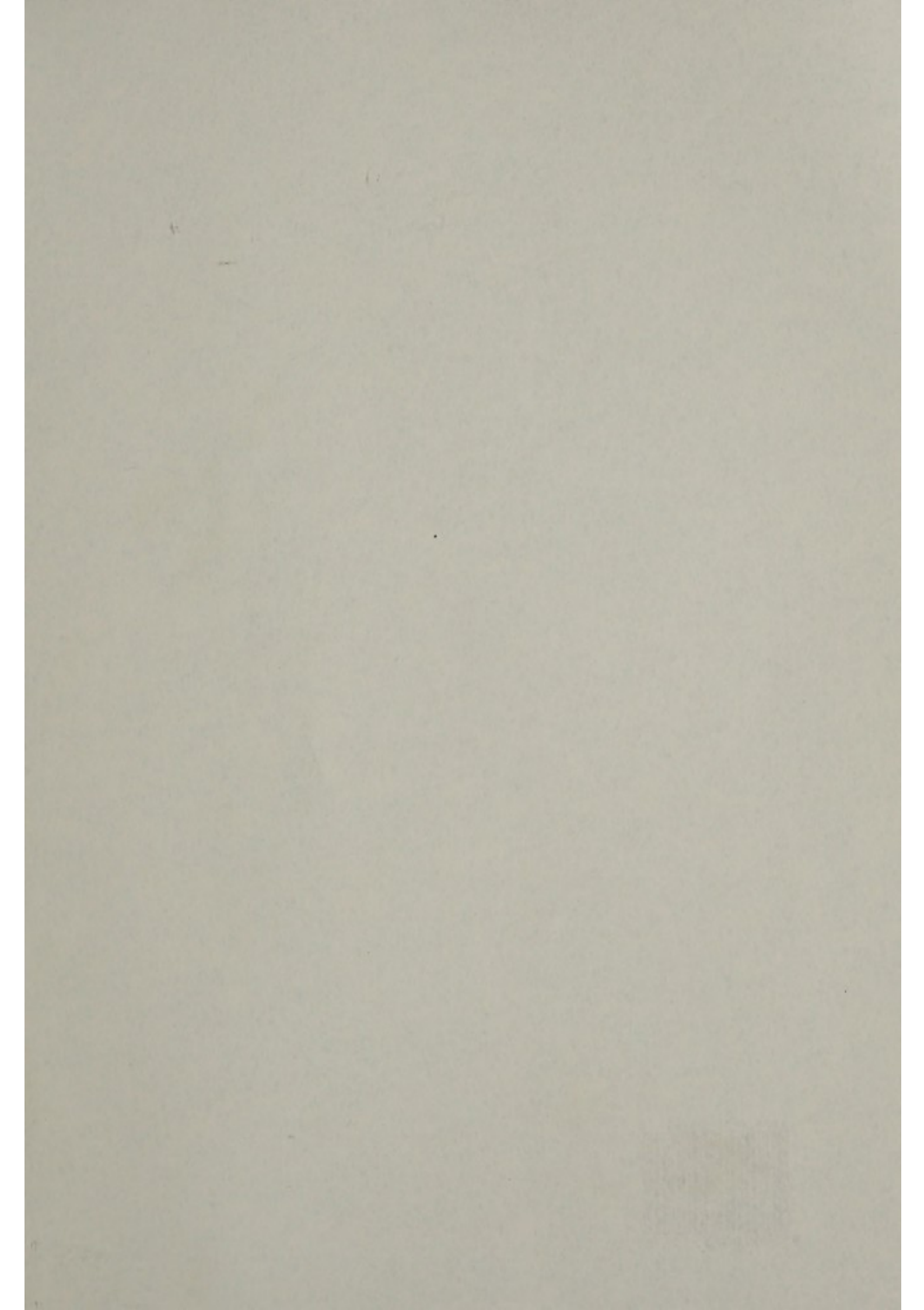
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