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**FOREWORD BY  
THE SECRETARY OF STATE FOR TRADE AND INDUSTRY  
THE RT HON PETER MANDELSON MP**

I am glad to announce the Allocation of the Science Budget, which is designed to ensure that the Science and Engineering Base will be fit for purpose at the start of the new Millennium.

The outcome of the Comprehensive Spending Review is solid evidence that enhancing the strength of the Science and Engineering Base is a major priority for Government.

For too long, we have been living by eating our seed corn. Government saw this as unsustainable. Accordingly, the Science Budget received the largest percentage increase compared with all Departmental Budgets.

Despite the very tight financial controls that the Government has rightly set itself, some £1 billion additional public funds, including £0.7 billion for the Science Budget, have been made available to the SEB over the next three years. Coupled with a further £0.4 billion additional funding pledged by the Wellcome Trust in a ground breaking partnership, the total additional funding is £1.4 billion.

Key components of the allocations are:

- by 2001-02 the Science Budget in real terms will be some 15% above its value this year;
- the £600 million Joint Infrastructure Fund (JIF), £300 million each from the Wellcome Trust and the Science Budget, will specifically address the problems of crumbling university research laboratories and obsolete equipment identified by Dearing;
- support for highly trained people, the most important output of the Science and Engineering Base, is to be increased. People are the key to knowledge transfer. The minimum stipend for PhD students has been increased by £1000 pa, the number of Royal Society Research Fellows are to be increased from 265 to over 300, and the Royal Academy of Engineering will introduce a pilot scheme along similar lines;
- for the first time, Research Councils have been given firm allocations for three years, thus allowing them to make firm long term plans;
- PPARC's domestic programme is protected in real terms and it further benefits by a saving of about 3.75% per annum in fixed costs. Furthermore, £30 million has been reserved to protect its international subscriptions against fluctuations related to currency and net national income variations;
- all of the Councils receive more than level funding in real terms;
- increased allocations to MRC and BBSRC will allow an expansion in biomolecular and biomedical research including exploration and the subsequent exploitation of the function of the human genome;

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- PRARC's domestic programme is protected in real terms and a further benefit by a saving of about 3.75% per annum in fixed costs. Furthermore, £20 million has been reserved to protect its international subscriptions against fluctuations in currency and non-national income variations;
- all of the Councils receive more than level funding in real terms;
- increased allocations to MRC and BBSRC will allow an expansion in biomedical and biomedical research including expansion and the subsequent expansion of the function of the human genome.

- £20 million is allocated to the novel University Challenge fund of £40 million which will encourage universities to develop promising ideas emerging from their research into practical and exploitable propositions.

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## INTRODUCTION

1. This report sets out details of the Comprehensive Spending Review (CSR) of the Science Budget, which provided some additional £700 million over three years and was part of an overall package of additional support for the Science and Engineering Base amounting to some £3.4 billion as set out in Table 1. It also explains the

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## INTRODUCTION

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## INTRODUCTION

The present sets out details of the Comprehensive Spending Review (CSR) of the Science Budget, which provided some additional £100 million over three years and was part of an overall package of measures aimed at reducing the Science and Engineering Budget to some £1.4 billion as set out in Table 1. It also explains the



policy framework and provides that drive the allocation process to the Research Councils and other bodies.

3. Of the additional £700 million for the Science Budget 1995, which is expected to be allocated as the Science Budget contribution to the partnership with the Wellcome Trust, which will provide a total of £200 million for the research in university research laboratories and equipment. The remainder of the £500 million is available for allocation to the Research Councils and other bodies for support of research within the Science and Engineering Area (SEA). Some of this funding is for generic activities, which will result in further allocations to specific Research Councils in due course. The allocations are summarised in Tables 4 and 5 (page 15) and are more fully in Annex A (page 16).

4. The CSR involved analysis and consultation on an unprecedented scale on the Science Budget and its outcome, both real and potential. The DGRC, which has been created out of the merger of the Government departments, Industry, Forestry and Fisheries, and the Science and Technology Department, has been established in the Science and Technology Department. The work involved extensive consultation with the research community, including the international components published by the Chief Scientific Adviser. The Science Group for the Science Budget CSR, chaired by the DGRC, had cross-departmental membership, including the Treasury. The Science Group approved the CSR analysis, which was subsequently accepted by Ministers.

5. These allocations, now announced, are in accord with the CSR's analysis. As a result of the CSR, as detailed below, the Royal Society, Royal Academy of Engineering and the Research Councils under PPARC receive increased allocations which are in excess of level funding in real terms. PPARC's current programme is protected in real terms but within that approximately £1.5 billion of the budget is no longer protected by fixed costs associated with the running of the two home Governments and is now available for its domestic programme.



## The New Financial Framework

5. Before the outcome of the Comprehensive Spending Review (CSR), the Government announced a number of reforms to the regime for planning and controlling public expenditure in its Economic and Fiscal Strategy Report in June 1998.

6. In previous years the Public Expenditure Survey process (PES) resulted in a firm allocation for the forthcoming financial year with indicative planning figures being given for the following years. To remove the constraints imposed by such rigid annuality, the new procedures introduced firm three year settlements and the flexibility to carry forward allocations to subsequent years. These measures will allow greater certainty in forward planning and facilitate sensible cash management across the financial year-ends.

7. The Government has two fiscal rules:

- the golden rule whereby, over the economic cycle, it will borrow only to invest and;
- the sustainable investment rule whereby public debt as a proportion of national income will be held at a prudent and stable level over the economic cycle.

These fiscal rules mean that a greater emphasis must be placed on the distinction between capital and recurrent expenditure. The new procedures give firm allocations for the years 1999-2000 to 2001-02 for both capital and recurrent expenditure.

## The Comprehensive Spending Review Settlement

8. The total settlement for the Science Budget and other related science funding is summarised in Table 1 below. ***It does not include the additional £25m for the Science Budget in 1998-99*** which was also secured in the CSR settlement.

Table 1	£ million				
	1998-99	1999-00	2000-01	2001-02	TOTAL
<b>SCIENCE BUDGET</b>					
Cash baseline	1,338	1,338	1,338	1,338	
Additional Programmes: Current: real terms		35	69	104	208
New additional		15	30	30	75
Additional Capital			40	60	100
Joint Infrastructure Fund Capital		75	100	125	300
University Challenge		10	10		20
Total Additions		135	249	320	703
<b>TOTAL NEW SCIENCE BUDGET</b>		<b>1,473</b>	<b>1,587</b>	<b>1,658</b>	
% increase in cash terms over 1998-99 baseline		10.1%	18.5%	23.8%	
% increase in real terms over 1998-99 baseline		7.3%	12.7%	14.8%	
<b>Summary of Additional Funds for the Science and Engineering Base</b>					
Total addition to Science Budget					703
Additional funds for DfEE					300
Wellcome contribution : Infrastructure fund			300		
DIAMOND			100		
					400
<b>TOTAL</b>					<b>1,403</b>

### Capital

9. In general capital provision should not be spent on current expenditure, there is however some limited margin of flexibility to move capital into recurrent to reflect the changing breakdown of expenditure forecasts. There will be no limits for moving current spending into capital budgets. The Science budget already included some £96m in the baseline, of which some two-thirds is the capital element of research grants to Higher Education Institutes (HEIs) with the balance being capital expenditure within Research Council Institutes. The CSR settlement provided additional capital for programmes, a further £100m capital fund and £300 for the Joint Infrastructure fund.

Table 2	<b>CAPITAL ELEMENTS OF THE SCIENCE BUDGET</b> <b>£m</b>
---------	--





	1998-99	1999-2000	2000-01	2001-02
<b>WITHIN PRE-CSR BASELINE</b>	<b>96.166</b>	<b>96.166</b>	<b>96.166</b>	<b>96.166</b>
Additional Capital for programmes		2.500	4.967	7.495
Additional Capital			40.000	60.000
Joint Infrastructure Fund		75.000	100.000	125.000
<b>TOTAL CAPITAL</b>	<b>96.166</b>	<b>173.666</b>	<b>241.133</b>	<b>288.661</b>

• reducing the cost of running or enhancing the result of research, social, food, agricultural and environmental projects

• improving the quality of life

In a recent article the Prime Minister said that the Science Base was the linchpin behind 'of our economic performance'.

11 The SSB is critical to key priorities at the top end of education, health, social issues and modernisation. It contributes significantly to the standing of the UK in the international field, adding UK high technology exports of goods and services, and inward investment. It is a key factor in maintaining the authority that the UK can bring to international negotiations where there is a significant science or technological basis, such as Kyoto.

12 A stable and internationally competitive research base is accepted as essential to the future industrial and commercial strength of the country, and hence also to the prosperity and well-being of the UK population.

#### People Base

13 The primary output from the SSB is highly trained people. Indeed a major strength of UK science lies in the PhD educating system, which not only provides the key people for the future but also where much high quality research is done. These are the future researchers and academics who will sustain our SSB and higher education sector, as well as some industry.

14 Until 1995 the basic spend for most Research Councils' PhDs was unchanged in real terms since 1985. The additional £20m funding for 1995-96 was used in part to fund an immediate increase of £1.000 in the basic student stipend and these allocations provide, through additional provision amounting to some £12m a year, for that increase to be sustained by all Councils without the need to redirect other funds.

15 Improved funding is made available to the Royal Society to fund more University Research Fellowships for top very best young post-doctoral scientists and engineers and to boost the Dorothy Hodgkin Fellowship scheme. The Royal Academy of Engineering is provided with further funds for a post Research Fellowship scheme.

#### Infrastructure

16 The *Deering Report*<sup>1</sup> drew attention to the unsatisfactory situation with research infrastructure within universities. Although we have a number of outstanding loans, some very well equipped, overall Deering found there was a need to replace a large amount of obsolete equipment if the UK were to remain at the leading edge of research. The CSR settlement made substantial provision to address these problems and there are three major initiatives designed to improve the infrastructure situation.

#### Joint Infrastructure Fund

17 The CSR created a pot fund of £250 million to provide a 'one-off' programme towards addressing the infrastructure problems of the universities.

18 The Joint Infrastructure Fund (JIF) funded equally by the Government and the Wellcome Trust covers the full spectrum of science, engineering, economic and social sciences. It will provide for buildings, major equipment and other elements of infrastructure of the universities. The Wellcome Trust component of the Fund will, by virtue of the Trust's charitable objects, be used for infrastructure relevant to biomedical and related research facilities.

<sup>1</sup> Science 24 August 1994 p 1141

<sup>2</sup> Report of the National Committee of Enquiry into the SSB July 1997

2010-2011	2011-2012	2012-2013	2013-2014	WITHIN THE BASELINE
100.00	100.00	100.00	100.00	Additional State Income Tax
100.00	100.00	100.00	100.00	Additional Local Income Tax
100.00	100.00	100.00	100.00	Additional Federal Income Tax
100.00	100.00	100.00	100.00	TOTAL INCOME TAX



## GOVERNMENT POLICY FOR THE SCIENCE BUDGET

10. The Science Budget, and the Science and Engineering Base (SEB) that it supports, provides a vital underpinning to a wide range of national efforts in:

- the creation of prosperity
- reducing the cost of eliminating or ameliorating the result of medical, social, food, agricultural and environmental problems
- improving the quality of life

In a recent article the Prime Minister said that the Science Base was the *'absolute bedrock of our economic performance'*.<sup>1</sup>

11. The SEB is crucial to key priorities at the top end of education, health, social issues and modernisation. It contributes significantly to the standing of the UK in the international field, aiding UK high technology exports of goods and services, and inward investment. It is a key factor in maintaining the authority that the UK can bring to international negotiations where there is a significant science or technological basis, such as Kyoto.

12. A viable and internationally competitive research base is accepted as essential to the future industrial and commercial strength of the country, and hence also to the prosperity and well-being of the UK population.

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13. The primary output from the SEB is highly trained people. Indeed a major strength of UK science lies in the PhD studentship system, which not only provides the key people for the future but also where much high quality research is done. These are the future researchers and academics who will sustain our SEB and higher education sector, as well as serve industry.

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16. The *Dearing Report*<sup>2</sup> drew attention to the unsatisfactory situation with research infrastructure within universities. Although we have a number of outstanding teams, some very well equipped, overall Dearing found there was a need to replace a large amount of obsolete equipment if the UK were to remain at the leading edge of research. The CSR settlement made substantial provision to address these problems and there are three major initiatives designed to redress the infrastructure deficiencies:

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<sup>1</sup> Science 21 August 1998 p 1141.

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In a recent article the Prime Minister said that the Science Base was the backbone of our economic performance:

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12 A world and internationally competitive research base is accepted as essential to the future industrial and commercial strength of the country, and hence also to the prosperity and well-being of the UK population.

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14 Until 1995 the basic spend for most Research Councils was unchanged in real terms since 1988. The additional £25m funding for 1995-98 was used in part to fund an increase in the basic spend of £1,000 in the basic spend and these allocations provide, through additional provision amounting to some £12m a year, for that increase to be sustained by all Councils without the need to redirect other funds.

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The first call for applications was issued on 1 October 1998. There will be several decision points over the next few years with the last round of decisions being taken in March 2001.

19. It will be allocated after peer review of competing bids. The first criterion will be scientific excellence but strategic priorities, as outlined in the CSR, will be relevant. The allocation will be made by a Joint Executive Committee, chaired by the DGRC (deputy chairman, the Director of the Wellcome Trust)

20. The programme's objective is to transform the working environment, and enhance the UK research community's research capability by creating a flexible scheme that can respond to the academic research community's real needs. Requests may therefore range from major refurbishment projects, through single items of equipment, to state-of-the-art buildings and facilities to house centres of national and international importance concerned with the exploitation and science-driven advancement of novel technologies. The minimum project threshold is £750k. The scheme does not of itself expand the size of the research workforce.

*Synchrotron Radiation Source (SRS) at Daresbury*

#### Synchrotron Radiation Source (SRS) at Daresbury

21. There is a plan to replace the current high intensity X-ray Synchrotron Radiation Source (SRS) at Daresbury early in the next decade with a new facility. This investment is an essential tool for advancing activities in many areas from engineering materials through to living tissue, without which the UK Science and Engineering Base would be severely disadvantaged. A new UK facility is seen by industry as a major component of the continuum of world-class research through to industrial exploitation.

22. The new instrument, which will be up to 10,000 times brighter than its predecessor, is necessary to help maintain the UK's position in many fields from materials research to the life sciences, especially work following on from the current genome mapping project. It will be commissioned in about five years time and will have a critical role to play in analysing the structure and function of proteins subsequently identified from the genome sequence.

23. The project to design and build this is currently estimated to cost around £175m and is being jointly funded as part of the partnership between the Wellcome Trust and Government. Wellcome's contribution to the project is £75m in total. £22m has been set aside for the initial stage of the project in the current CSR allocation, which covers the first two years of the project.

The first set of operations was carried out in 1980. There will be several further phases over the next few years and the last round of decisions being taken in March 1987.

It will be allocated after each round of negotiations. The first round will be allocated to the first round of negotiations, as outlined in the CDR, and the second will be made by a Joint Committee (established by the DORC) during the second round of negotiations.

The programme's objective is to enhance the existing environment and enhance the UK's scientific research capability by creating a flexible system that can respond to the changing needs of the research community. Research may involve major equipment projects, through single items of equipment, or state-of-the-art facilities and facilities in house centres of national and international importance. The programme will be allocated and managed on a project basis. The programme will be allocated and managed on a project basis. The programme will be allocated and managed on a project basis.



## Joint Research Equipment Initiative

21. The Joint Research Equipment Initiative (JREI) provides equipment to Universities on the basis of a partnership in which some funds are provided by the private sector. The JREI has proved to be an outstanding success providing £80 million of equipment in the last round (JREI 97) from a public investment of £35 million. Table 3 shows the analysis by Research Council area of interest, of the public sector contribution to awards made in this round. These sums are in addition to the funds for equipment contained in the Research Council project allocation.

Table 3

RESEARCH COUNCIL AREA	EQUIPMENT FUNDING £M
BBSRC	5.7
EPSRC	19.2
MRC	5.7
NERC	1.2
PPARC	3.1
<b>TOTAL</b>	<b>34.9</b>

22. It is proposed to develop this initiative. £ 7m/10m/10m has been provided over the period for continuing rounds of the JREI.

## Synchrotron Radiation Source (DIAMOND)

23. There is a need to replace the current high intensity X-ray Synchrotron Radiation Source (SRS) at Daresbury early in the next decade with a new facility. This instrument is an essential tool for determining structures in many areas from engineering materials through to living tissue, without which the UK Science and Engineering Base would be severely disadvantaged. A new UK facility is seen by industry as a crucial component of the continuum of basic/strategic research through to industrial exploitation.

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26. The provision of funds for helping university research departments to a point where their commercial potential can be demonstrated and the way taken to secure that with. These funds are normally to be used with care and to ensure the commercial potential of research is a sufficient extent that for example a sound and robust business plan can be produced and subsequently supported approaches made for venture capitalists, structures for financial support for the commercialisation process, or to established companies to take forward the product or process.

27. The University Challenge Fund has been set up by charities up to £20 million from the Wellcome Trust and the Gatsby Foundation Foundation and the Science Budget Foundation, to focus primarily on the acceleration of science and engineering research activities by enabling projects to access start funds in order to speed the successful commercialisation of good research and good business. The main funding is the direct stage to the venture process. The fund will not necessarily be self-sustaining although it is highly desirable that this should be.

28. The scheme is open only to universities and certain research institutes. It is currently anticipated that 10-20 awards may be made from a single round of the scheme in 1999-00.

29. The availability of seed funds can help the commercialisation process in a number of ways - financing studies to commercial ends, by securing or enhancing intellectual property, by supporting additional R&D development of a prototype, preparation of a business plan, covering legal costs, etc. The funds are not to be used for "start and rest" projects such as building incubator units.

30. The university must normally raise at least 25% of the total University Challenge Seed Fund investment as a UGCF proposal to contribute from its own resources, from alumni, industry (start or potential), business angels, venture capital funds, and any other suitable contributors. Contributions to the fund should normally be donations but interest free loans may form part of the contribution. It is for the winning applicants to manage the funds to their best advantage, in line with the rules and guidelines of the scheme.

## Raising Our Potential Awards (ROPAs)

31. ROPAs fund research of the researcher's own choosing. Industry does not share in the funding or definition of the ROPA project. But evidence of industrial funding for other basic or strategic research is the



21. The Joint Research Equipment Initiative (JREI) provides equipment to universities on the basis of a grant-in-aid which funds are provided by the public sector. The JREI has agreed to be an outstanding success providing £80 million of equipment in the last round (JREI 97) with a public investment of £25 million. Table 2 shows the analysis by Research Council area of interest of the public sector contribution to awards made in this round. These sums are in addition to the funds for equipment contained in the Research Councils' project allocation.

22. It is proposed to develop the initiative. The JREI has been provided over the period for continuing rounds of the JREI.

#### Synchrotron Radiation Source (SRS)

23. There is a need to replace the current high intensity X-ray Synchrotron Radiation Source (SRS) at Daresbury early in the next decade with a new facility. This instrument is an essential tool for determining structures in many areas from engineering materials through to living tissue, whilst within the UK Science and Engineering Base would be severely disadvantaged. A new UK facility is seen by industry as a critical component of the continuum of strategic research through to industrial exploitation.

24. The new instrument, which will be up to 10,000 times brighter than its predecessor, is necessary to help maintain the UK's position in many fields from materials research to the life sciences, especially work following on from the current genome mapping project. It will be commissioned in about five years time and will have a crucial role to play in enabling the structure and function of proteins consequently identified from the genome sequence.

25. The project to design and build this is currently estimated to cost around £175m and is being jointly funded as part of the partnership between the Wellcome Trust and Government. The Government's contribution to the project is £110m in total. £55m has been set aside for the initial stage of the project in the current CSE allocation, which covers the first two years of the project.

Table 2	
Research Council Area	Contribution (£m)
Biological Sciences	15.0
Chemical Sciences	10.0
Earth Sciences	5.0
Engineering Sciences	10.0
Life Sciences	10.0
Physical Sciences	5.0
<b>TOTAL</b>	<b>55.0</b>

**Interaction With Users: Knowledge Transfer**

26. A key finding of the CSR was that, while much has been done in recent years to encourage increased exploitation of Science Base outcomes, still more is needed. In particular, there is a need to increase the degree of interaction between UK firms and the Science Base, to ensure that UK firms maximise their opportunities to become fully competitive and to ensure that maximum value is realised from the public investment in the Science Base.

27. A number of schemes have been introduced including:-

- CASE, ROPA, Faraday Partnerships (Science Budget)
- TCS, LINK, (Science Budget and DTI ITS budget)
- Joint Research Equipment Initiative (Science Budget and HE Funding Councils)
- Postgraduate Teaching Partnership (PTP) (ITS Budget)

28. Each scheme was introduced to address a particular issue but they all aim to increase the level of collaboration between industry and the science base. Such schemes will only be successful if they are tailored to the needs of the companies and sectors at which they are targeted.

29. But a key aspect of exploitation of SEB outcomes is the people dimension. Without innovation there is no competitiveness and without the right people and attitudes there is no innovation. Hence, the most important pathway through which the economy derives benefit from the SEB is through the movement of people, and especially through enhancing the contact of academic researchers with commercial organisations. The principal means of knowledge transfer is by recruitment of people. For this and other reasons there is particular attention on people and the number of short term contract researchers - now 30,000.

*The University Challenge Fund*

30. There is a gap in the UK in the provision of finance for bringing university research discoveries to a point where their commercial usefulness can be demonstrated and first steps taken to secure their utility. These steps are necessary to reduce technical risk and determine the commercial potential of discoveries to a sufficient extent that, for example, a sound and cogent business plan can be produced and adequately supported approaches made, for instance, to funders for financial support for the commercialisation process, or to established companies to take licences to the product or process.

31. The University Challenge Fund has been set up by charities (up to £20 million, from the Wellcome Trust and the Gatsby Charitable Foundation) and the Science Budget (£20 million) to focus primarily on the exploitation of science and engineering research outcomes by enabling universities to access seed funds in order to assist the successful transformation of good research into good business. This early funding is the riskiest stage of the venture process. The funds will not necessarily be self-sustaining although it is highly desirable that they should be.

32. The scheme is open only to universities and certain research institutes. It is currently anticipated that 15-20 awards may be made, from a single round of the scheme in 1998-99.

33. The availability of seed funds can help the commercialisation process in a number of ways - financing access to managerial skills, by securing or enhancing intellectual property; by supporting additional R&D; construction of a prototype; preparation of a business plan; covering legal costs; etc. The funds are not to be used for "bricks and mortar" projects, such as building incubator units.

34. The university must normally raise at least 25% of the total University Challenge Seed Fund (referred to as a UCSF) it proposes to establish from its own resources, from alumni, industry (local or national), business angels, venture capital funds, and any other suitable contributor. Contributions to the fund should normally be donations but interest free loans may form part of the contribution. It is for the winning applicants to manage the funds to their best advantage, in line with the rules and guidelines of the scheme.

*Realising Our Potential Awards (ROPAs)*

35. ROPAs fund research of the researcher's own choosing. Industry does not share in the funding or definition of the ROPA project. But evidence of industrial funding for other basic or strategic research is the necessary entry ticket to the competition. Since the ROPA scheme was set up in 1994, over 1,200 awards have



20 A key finding of the CSR was that while much has been done in recent years to increase the effectiveness of Science Base outcomes, and more is needed in particular, there is a need to increase the degree of interaction between UK firms and the Science Base to ensure that UK firms maximise their opportunities to become fully competitive and to ensure that maximum value is realised from the public investment in the Science Base.

21 A number of schemes have been introduced including:

- CASE ROPA, University Partnerships (Science Budget)
- TCS LINK (Science Budget and DTI/TS Budget)
- Joint Research Equipment Initiative (Science Budget and HE Funding Council)
- Postgraduate Training Partnerships (RPI/TS Budget)

22 Each scheme was introduced to address a particular need but they all aim to increase the level of collaboration between industry and the science base. Such schemes will only be successful if they are tailored to the needs of the companies and sectors in which they are targeted.

23 One key aspect of expansion of SSB outcomes is the people dimension. Without innovation there is no competitiveness and without the right people and attitudes there is no innovation. Hence, the most important gateway through which the economy derives benefit from the SSB is through the movement of people, and especially through enhancing the contact of academic researchers with commercial organisations. The principal means of knowledge transfer is by recruitment of people. For the and other sectors there is particular attention on people and the number of short term contact researchers - now 30,000.

## The University Challenge Fund

24 There is a gap in the UK in the provision of finance for bringing university research discoveries to a point where their commercial usefulness can be demonstrated and first steps taken to secure their utility. There is also the need to reduce financial risk and determine the commercial potential of discoveries to a sufficient extent that for example, a sound and cogent business plan can be produced and adequately supported approaches made for instance to lenders for financial support for the commercialisation process, or to established companies to take licences in the product or process.

25 The University Challenge Fund has been set up by changes (up to £20 million from the Wellcome Trust and the Gatsby Charitable Foundation) and the Science Budget (£20 million) to focus primarily on the expansion of science and engineering research outcomes by enabling universities to access seed funds in order to assist the successful translation of good research into good business. This early funding is the earliest stage of the venture process. The fund will not necessarily be self-sustaining although it is highly desirable that they should be.

26 The scheme is open only to universities and certain research institutes. It is currently anticipated that 15-20 awards may be made from a single round of the scheme in 1994-95.

27 The availability of seed funds can help the commercialisation process in a number of ways - financing access to managerial skills, by securing or enhancing intellectual property, by supporting additional R&D, construction of a prototype, preparation of a business plan, covering legal costs, etc. The funds are not to be used for "bricks and mortar" projects, such as building incubator units.

28 The University must normally raise at least 25% of the total University Challenge Seed Fund (related to a £100,000 grant) to establish from its own resources, from student, industry (local or national), business, venture, venture capital funds, and any other suitable contributor. Contributions to the fund should normally be shared, but interest free loans may form part of the contribution. It is for the winning applicants to manage the funds to their best advantage, in line with the rules and guidelines of the scheme.

## Reaching Our Potential Awards (ROPAs)

29 ROPAs fund research of the researcher's own choosing, initially does not show in the funding or status of the ROPA project. But evidence of industrial funding for other basic or strategic research is the necessary entry ticket to the competition. Since the ROPA scheme was set up in 1994, over 1,700 awards have

been made at a total cost of over £109 million. ROPA-funded work is opening new research avenues, attracting follow-up funding from the Research Councils, industry, the EC and other sources. ROPAs fund speculative research and are not aimed at direct commercial benefits and do not involve a commercial partner but their existence provides a profound incentive for academics to develop strategic links with industry. ROPAs are available across all the scientific disciplines supported by the Research Councils.

36. ROPAs are now an established Research Council funding mechanism and as such these allocations provide for future rounds of awards to continue at the same or greater funding levels and the scope for expansion of the scheme is being explored. The recent survey<sup>3</sup> has revealed that ROPA projects have been particularly fruitful in producing new research avenues and that they, together with the PhD studentship programme are important vehicles for truly innovative research not subject to over conservative refereeing. **They are key components of responsive mode funding and Government wishes to see responsive mode, in general, increased even within specified priority areas.**

#### *Foresight LINK Awards*

37. As part of the LINK programme, a competition has been run for LINK projects in selected high priority Foresight areas. Provision is made for £1/2/2 million in the three years for the first round, and a further £0/1/2 million for a second round. These will be matched by funds from the DTI Innovation Budget or from another Department making a total public sector contribution to each round over three years of £10 million.

#### *CSR Targets*

38. The CSR set two new targets for the ScienceBudget over the three years to 2001-02:

- *Maintain the quality and relevance of the SEB as measured by agreed international standards.*
- *Increase by 50% the number of companies established annually as a result of the public sector science base.*

Both focus on standards and activities already inherent in the application of Science Budget funds. Internationally recognised Bibliometric measures are used to monitor the quality of the research produced by the SEB. The generation of spin-off companies is one of a range of measures designed to facilitate the exploitation of the knowledge and expertise generated within the SEB.

45. *Minister's speech underpin many key areas including: health care, food production, understanding impacts on the environment, and a wide range of industrial products and processes. As such this area is a priority for the Science Base.*

#### *IT And Communications*

46. *A second pervasive and profound influence on the direction of the world in the 21st Century will come from the rapid developments in IT and communications. This is also an area where the UK is strong in many areas and can capitalise on its strengths through developments that will transform the City and other aspects of economic, commercial, education and the increasingly important leisure industry. Together with the growth this area will dominate the successful economies of the 21st Century.*

#### *Ageing: EQUAL*

47. *Over the last 20 years, life expectancy for men and women has risen by about four years but the healthy life expectancy has remained unchanged. We therefore face the prospect that not only is the population ageing, but a greater proportion of the population will be dependent on the State through disability. A primary focus of ageing research, including universal programmes such as the Extend Quality Life (EQUAL) initiative, should be to extend the number of years during which individuals may expect to enjoy active, fit and participating lifestyles.*

#### *Environment And Climate Change*

48. *Increasingly the Government is becoming dependent on scientific advice on matters such as the*

<sup>3</sup> *Realising Our Potential Award Scheme: Outcomes Survey, OST July 1998*



Both focus on standards and activities already inherent in the application of Science Based Fundraising. International recognised Scientific measures are used to monitor the quality of the research generated by the SBF. The generation of spin-off companies is one of a range of measures designed to facilitate the exploitation of the knowledge and expertise generated within the SBF.

- Increase by 50% the number of companies established annually as a result of the public sector advice
- Maintain the quality and relevance of the SBF as measured by agreed international standards

The SBF set two new targets for the Science Budget over the five years to 2007-08:

#### CSF Targets

Department making a total public sector contribution to each round over three years of £10 million for a second round. There will be matched by funds from the DTI Innovation Budget or from another source. As part of the CSF programme, a competition has been run for CSF projects to selected high priority research areas. Provision is made for £120 million in the three years for the first round, and a further £200 million for a second round.

#### Foreign Link Awards

Increased even within specified priority areas.

Components of responsive mode funding and Government wishes to see responsive mode, in general, important vehicles for truly innovative research not subject to over conservative refereeing. They are key factors in producing new research evidence and that they together with the PhD studentship programme are at the centre of being explored. The recent survey has revealed that RCUK projects have been particularly provide for future rounds of awards to continue at the same or greater funding levels and the scope for expansion of the scheme is being explored. The recent survey has revealed that RCUK projects have been particularly provide for future rounds of awards to continue at the same or greater funding levels and the scope for expansion of the scheme is being explored.

RCUK are now an established Research Council funding mechanism and as such have established a proven track record of over £100 million RCUK-funded work. A growing new research evidence of funding follow-up funding from the Research Councils, notably the ES and other sources. RCUK's fund operations research and are not aimed at direct commercial benefits and do not involve a commercial return on their extensive provision a profound incentive for academics to develop strategic links with industry. RCUK are available across all the scientific disciplines supported by the Research Councils.

## ALLOCATIONS TO FUNDED BODIES

### Scientific Priorities

39. The CSR came at a critical time for science in the UK and, indeed, in the world. We are about to see an explosion in enabling information related to the structure of the human genome, an area in which the UK science base has been in the lead. The impact of this will be that there is a major opportunity for using this information as a basis for new and scientifically intensive industries worth £10s of billions which will both impact on quality of life and provide new openings for creating prosperity.

40. For the most part, the exploitation will be a matter for business, but they will depend on the SEB for enabling basic and strategic research and for providing the highly qualified scientists essential for such work. Initiatives designed to facilitate knowledge transfer from the SEB described above.

### The Post Genome Challenge

41. The key area is the need for a major expansion in molecular, biomolecular and biomedical research. This is an area whose time has come - the recent rapid advances in genetic analysis and manipulation techniques, together with the major advances in recent years in information technology, novel synthetic and combinatorial chemistry, and in other areas, has opened up major new opportunities. Specifically, it is anticipated that the human genome will be fully sequenced by around 2005, although advances are being made almost weekly.

42. In effect, the human genome is a compendium of about 100,000 books of fundamental information - the genes. Hitherto most have remained closed. However, the amazing advances in recent years mean that early in the new millennium all 100,000 books will be accessible to anyone who has invested in the necessary skills - particularly our competitors.

43. Many of the advances in understanding human genes have depended on our understanding of the genes of primal organisms. Thus the functions of the breast cancer genes were solved by finding a related gene in yeast. Hence plant and animal genomes are crucial to the understanding of the human genome.

44. Fortunately, molecular and related sciences are areas in which the UK is already excellent, and has some world class companies operating at the forefront of the technology. The books of information are, however, not books of instruction. Rather, they will open up many areas for pre-commercial fundamental research which will be necessary before applications can be foreseen, much less seized. To be able to capitalise on the looming revelation of the human genome structure demands a major boost to our basic and strategic science capabilities, so that we (especially industry) have the necessary skills, techniques and above all, trained people able to exploit this once-in-a-century opportunity.

45. Molecular sciences underpin many key areas including, health care, food products, understanding impacts on the environment, and a wide range of industrial products and processes. As such this area is a priority for the science base.

### IT And Communications

46. A second pervasive and profound influence on the direction of the world in the 21st Century arises from the rapid developments in IT and communications. This is also an area where the UK is strong in many areas and can capitalise on its strengths through developments that will transform the City and other aspects of electronic commerce, medicine, education and the increasingly important leisure industry. Together with the genome this area will dominate the successful economies of the 21st Century.

### Ageing: EQUAL

47. Over the last 20 years, life expectancy for men and women has risen by about four years but the healthy life expectancy has remained unchanged. We therefore face the prospect that not only is the population ageing, but a greater proportion of the population will be dependant on the State through disability. A primary focus of ageing research, including umbrella programmes such as the Extend Quality Life (EQUAL) initiative, should be to extend the number of years during which individuals may expect to enjoy active, fit and participating lifestyles.

### Environment And Climate Change

48. Increasingly the Government is becoming dependent on scientific advice on matters such as the environment and climate change. But the pressures are projected to grow with these sciences being so relevant to high priority problems - not just for the government but also for business and our public services. In the case of



## Scientific Frontiers

49 The 21st century is a critical time for science in the UK and indeed in the world. We are about to see an explosion in scientific information related to the structure of the human genome, an area in which the UK science base has been in the lead. The impact of this will be that there is a major opportunity for using this information as a basis for new and scientifically innovative industries worth £700 of business which will help secure an edge to the UK and provide new openings for training graduates.

50 For the most part, the expectation will be a matter for business, but they will depend on the SES for funding basic and strategic research and for providing the highly qualified scientific essential for such work. Business designed to replicate knowledge transfer from the SES described above.

## The Post-Genome Challenge

51 The key area is the need for a major expansion in molecular biotechnology and biomedical research. This is an area where time has come - the recent rapid advances in genetic analysis and manipulation techniques together with the major advances in information technology, novel synthetic and computerised technology, and in other areas, has opened up major new opportunities. Scientifically it is anticipated that the human genome will be fully sequenced by around 2005, although advances are being made almost weekly.

52 In effect, the human genome is a compendium of about 100,000 books of fundamental information - the genetic library most have remained closed. However, the existing techniques to read these books that only in the new millennium all 100,000 books will be accessible to anyone who has invested in the necessary skills - genetically our computers.

53 Many of the advances in understanding human genes have depended on our understanding of the genes of other organisms. Thus the function of the breast cancer genes were solved by finding a related gene in yeast. Human plant and animal genomes are crucial to the understanding of the human genome.

54 Fortunately, molecular and related sciences are areas in which the UK is already excellent, and has some world class companies operating at the forefront of the technology. The books of information are however not being effectively written. Rather, they will open up many ways for the commercial fundamental research which will be necessary before applications can be foreseen. Much has been said. To be able to capitalise on the coming revolution of the human genome demands a major boost to our basic and strategic science capabilities, so that we (especially industry) have the necessary skills, techniques and space to exploit people able to exploit this once in a century opportunity.

55 Molecular sciences underpin many key areas including health care, food production, understanding impacts on the environment, and a wide range of industrial products and processes. As such this area is a priority for the science base.

## IT And Communications

56 A second pervasive and profound influence on the direction of research in the 21st Century arises from the rapid developments in IT and communications. This is also an area where the UK is strong in many areas and has a strong base on its strengths through developments that will transform the UK and other aspects of electronic systems, medicine, education and the increasingly important leisure industry. Together with the genome this area will dominate the successful economies of the 21st Century.

## Ageing: EQUAL

57 Over the next 20 years, the expectancy for men and women has risen by about four years but the healthy expectancy has remained unchanged. We therefore face the prospect that not only is the population ageing but a higher proportion of the population will be dependent on the state through disability. A primary focus of policy research, including multi-disciplinary research, should be to ensure that the number of years during which individuals may expect to enjoy active, fit and participating lifestyles.

## Environment And Climate Change

58 Increasingly, the Government is becoming dependent on scientific advice on matters such as the environment and climate change. But the pressures are projected to grow with these sciences being so central to high profile problems - not just for the government but also for business and our public services - in the 21st



NERC, much of the science has progressed from mostly data collection and observing, to prediction of environmental effects and the impact of possible remediation. This opens up tremendous opportunities, such as greatly improving the competitiveness of insurance and other services, generating environmentally beneficial products and processes. Government will increasingly depend on such science if it is to have confidence in initiatives to protect and improve the environment.

### Social Sciences

49. Over the last few years there has been a fundamental repositioning of the social sciences within the physical and biological science base exemplified by ESRC's links with other Research Councils in innovation (EPSRC), food choice and risk (BBSRC), environmental management (NERC), health inequalities (MRC) and the social impact of information technology (EPSRC).

50. At the same time, with the collapse of central planning in Eastern Europe and increasing concerns about short-termism in Western market economics, the search is on for a sustainable "third way". Many of the big social questions which were considered settled are now being exposed to fresh thinking. In this connection there has been a remarkable synergy between the public policy agenda in Britain and major concentrations of ESRC research in such areas as: social exclusion, democratic renewal, integrated transport systems, urban re-development and the future of welfare and work.

### Health of the Physical Sciences and Engineering

51. The multidisciplinary programmes of MRC, BBSRC, NERC and EPSRC described above critically depend on strong responsive mode programmes in chemistry, physics and mathematics. Without this underpinning, directed programmes, no matter how high the priority, cannot succeed. Put another way, this means that most Research Councils are in effect users of EPSRC's basic science.

52. In most industrial processes it is the engineers that turn scientific ideas into new or improved products and processes. However, there is particular concern over the quality of the research in some university engineering departments. Here, as in all areas, there is world class research and world class teams in the UK but with engineering there is a worrying "tail" of research talent not quite up to world standards, most noticeably in chemical engineering, which of course underpins one of our strongest industrial sectors, and in biochemical engineering, which will underpin one of the major new industrial sectors of the next century.

53. One of the problems is the balance between maintaining professional engineering expertise and world class research capability. Engineering departments receive an exceptionally high percentage of their external income from industry, over two and a half that in the bio-sciences but attention needs to be paid to achieving a sound balance between professional development and consultancy activity and leading edge research within engineering departments. That the latter is lagging emerged from the international benchmarking.

54. The Science Budget allocations take careful account of these needs, on the one hand to ensure that impetus can be given to the priority areas, while on the other hand ensuring that the vital underpinnings are not compromised.

### BIOTECHNOLOGY AND BIOLOGICAL SCIENCES RESEARCH COUNCIL

#### Allocation

#### ESRC

#### Cash transfer

#### Real terms increase

	1999-00	2000-01	2001-02	2002-03
ESRC	£1,200m	£1,200m	£1,200m	£1,200m
Cash transfer	£1,200m	£1,200m	£1,200m	£1,200m
Real terms increase	0.0%	0.0%	0.0%	0.0%

#### Strategic Direction

HEPC must of the science has progressed from merely data collection and reporting to predictive environmental effects and the impact of possible intervention. This opens up the possibility of a more proactive approach to the management of the environment. The Government will increasingly depend on such science if it is to have any chance of protecting and improving the environment.

## Social Sciences

49 Over the last few years there has been a fundamental rethinking of the social sciences within the physical and biological sciences. This has been exemplified by HEPC's joint work with the Research Councils in the areas of (EPSC) food choice and risk (BSRC), on consumer management (BSRC), health research (BSRC) and the social impact of information technology (EPSC).

50 At the same time, with the collapse of central planning in Eastern Europe and growing concerns about short-termism in Western market economies, the search is on for a sustainable 'third way'. Many of the big questions which were considered settled are now being exposed to fresh scrutiny. In this context there has been a remarkable synergy between the public policy agenda in Britain and major developments at HEPC. Research in such areas as social exclusion, democratic renewal, integrated business systems, urban regeneration and the future of welfare and work.

## Health of the Physical Sciences and Engineering

51 The multidisciplinary programmes of MRC, BSRC, HEPC and EPSC have demonstrated a growing dependence on strong responsive mode programmes in chemistry, physics and mathematics. Whilst this understanding of the physical sciences is essential for the health of the physical sciences, it is not enough. The Research Councils are in effect using HEPC's best science.

52 In most industrial processes it is the engineer, not the scientist, who takes the lead in improved products and processes. However, there is a growing concern over the quality of the research in some university engineering departments. Here, as in all areas, there is a wide gap between research and what goes on in the UK and what is going on in the rest of the world. It is not just a matter of research being not quite up to world standards, but industry in chemistry, engineering, which of course underpins one of our strongest industrial sectors, and in biomedical engineering which are underpinning one of the major new industrial sectors of the next century.

53 One of the problems is the balance between maintaining traditional engineering expertise and world class research capability. Engineering departments receive an exceptionally high percentage of their external income from industry, over two and a half times that of the other sciences. This has led to a growing gap between professional development and research activity and leading edge research which is being eroded from the external funding base.

54 The Science Budget Allocation takes account of these needs, on the one hand, and the fact that the other hand, while on the other hand ensuring that the vital underpinnings are not compromised.



## Summary of Allocations to Research Councils, the Royal Society and the Royal Academy of Engineering

Table 4	£ million			
	1998-99	1999-2000	2000-01	2001-02
BBSRC	185.739	198.299	202.994	208.189
ESRC	65.990	69.754	71.174	72.901
EPSRC	382.982	397.584	410.850	427.179
MRC	290.208	304.538	319.173	334.068
NERC *	168.819	178.530	181.757	187.457
PPARC *	194.220	196.306	200.687	204.228
Royal Society	22.621	23.850	24.622	25.745
Royal Academy of Engineering	3.436	3.706	4.025	4.270
<b>TOTAL</b>	<b>1314.015</b>	<b>1372.568</b>	<b>1415.282</b>	<b>1464.037</b>

\* NERC and PPARC figures for 1998-99 have been adjusted for cash flow changes to show the underlying baseline.

## Total Additional Funding over a 1998-99 Level Cash Baseline


Table 5	£ million	
	1998-99	1999-00 to 2001-02
BBSRC	185.739	52.265
ESRC	65.990	15.859
EPSRC	382.982	86.667
MRC	290.208	90.155
NERC *	168.819	39.831
PPARC *	194.220	20.017
Royal Society	22.621	6.354
Royal Academy of Engineering	3.436	1.693

\* NERC and PPARC figures have been adjusted for cash flow changes to show the underlying baseline and therefore the Table 5 figures are not directly derived from Table 4.

## Headroom

55. These allocations should be viewed against the following background:

- At the beginning of the current financial year (i.e. pre CSR) the DGRC asked Research Councils, as a matter of prudence, to plan on the basis of level cash funding for the next three years (1999-2001). Furthermore, they were asked to commit no more than 95% in the second year and 90% in the third year of these provisions. As a result of the current allocations this inflexibility has been removed.
- Further flexibility arises from the return within the new baselines of sums (total £10.5m) previously allocated to earlier initiatives, now complete.
- Further flexibility is provided by the expenditure line assigned to DIAMOND. The Councils involved, MRC, BBSRC, EPSRC and NERC, do not have to find the necessary capital funding from within their new baselines.
- PPARC's domestic programme benefits from flexibility arising out of a reduction in fixed costs associated with savings connected with the restructuring of the Observatories (3.75%, totalling £11 million).

	<b>BIOTECHNOLOGY AND BIOLOGICAL SCIENCES</b>	
	<b>RESEARCH COUNCIL</b>	

## Allocation

	£M	£M	£M	£M
	1998-99	1999-00	2000-01	2001-02
BBSRC	185.739	198.299	202.994	208.189
Cash Increase		6.76%	9.29%	12.09%
Real terms Increase		4.06%	3.92%	3.98%

## Strategic Direction



2017-18	2016-17	2015-16	2014-15
107,100	107,100	107,100	107,100
12,000	12,000	12,000	12,000
12,000	12,000	12,000	12,000

# BIOTECHNOLOGY AND BIOLOGICAL SCIENCES RESEARCH COUNCIL



- PRARC's domestic programme benefits from flexibility arising out of a reduction in fixed costs associated with savings connected with the restructuring of the Costarator (3.75%, totalling £11 million).

- Further flexibility is provided by the expenditure line assigned to BIRAC. The Councils involved, BSRC, EPSRC and NERC, do not have to find the necessary capital funding from within their own resources.

- Further flexibility arises from the year within the new structure of being (total £10m) previously allocated to other initiatives, now complete.

- At the beginning of the current financial year (i.e. the BSRC) the BSRC asked Research Councils for a number of guidance to give on the basis of level cash funding for the next years (2015-2017). Furthermore, they were asked to commit no more than 5% in the second year and 5% in the third year of these provisions. As a result of the current allocation the flexibility has been removed.

These allocations should be viewed against the following background:

Table 5 shows the not directly shown from Table 4.

BSRC and EPSRC figures have been adjusted for cash flow changes to show the underlying picture and therefore the

Table 5	1998-99	2000-01 to 2001-02
BSRC	155,725	155,725
EPSRC	65,300	65,300
NERC	108,812	108,812
NERC*	108,812	108,812
PRARC*	108,812	108,812
Royal Society	22,021	22,021
Royal Academy of Engineering	2,427	2,427

Total Additional Funding over a 1998-99 level Cash Baseline

BSRC and EPSRC figures for 1998-99 have been adjusted for cash flow changes to show the underlying picture

Table 4	1998-99	1997-98	1996-97	1995-96
TOTAL	1314,812	1312,388	1312,388	1312,388
Royal Academy of Engineering	2,427	2,427	2,427	2,427
Royal Society	22,021	22,021	22,021	22,021
PRARC*	108,812	108,812	108,812	108,812
NERC*	108,812	108,812	108,812	108,812
NERC	108,812	108,812	108,812	108,812
BSRC	155,725	155,725	155,725	155,725
EPSRC	65,300	65,300	65,300	65,300
BSRC	155,725	155,725	155,725	155,725

Summary of Allocation to Research Councils, the Royal Society and the Royal Academy of Engineering

56. The BBSRC supports research and related training which underpins key economic and quality of life interests in the UK - pharmaceuticals and health care, sustainable agriculture and food production, food safety, and environmental protection. The UK's science and engineering base has well-proven strength across the biological sciences. Developments in molecular biology and genomics, in particular, are leading to rapid advance from where basic research has the potential to be translated relatively quickly to - sometimes unpredicted - applications. The recent restructuring of the BBSRC's committees, subsequent portfolio review, and new arrangements for institute support have put the Council in good position to respond to, but also identify and nurture the opportunities arising. The BBSRC programmes are underpinned by the basic research in chemistry, physics, mathematics and engineering supported by the EPSRC.

### Specific Allocations

57. It is particularly important that the BBSRC has the funds to respond to a sufficient proportion of the high-quality proposals originating from the science base. The increased allocation will enable the Council to increase its level of support for responsive-mode research grants over the next three years, as well as to stimulate activity in priority areas identified above and by the Council's committees which will expand and exploit the pervasive opportunities provided by the genomics revolution.

### Objectives

58. New objectives for the Council over the next three years are to:

- increase the proportion of the BBSRC budget committed to responsive-mode support to enable a higher proportion of internationally competitive research to be funded;
- increase the proportion of the budget devoted to genomics research;
- integrate further its activities with MRC and EPSRC.



### ECONOMIC AND SOCIAL RESEARCH COUNCIL

### Allocation

	£M	£M	£M	£M
	1998-99	1999-00	2000-01	2001-02
ESRC	65.990	69.754	71.174	72.901
Cash Increase		5.70%	7.86%	10.47%
Real terms Increase		3.02%	2.56%	2.48%

### Strategic Direction

59. There is an increased economic and social dimension to research carried out in other areas of the Science and Engineering base. Sustainable growth and quality of life are dependent on the behaviour of people and their response to the technology.

### Specific Allocations

60. Additional funding for the *Millennium Cohort*, a new cohort to collect lifetime data on those born in year 2000 across a range of areas, has been included in the above allocation.

### Objectives

61. The key new objectives for the Council over the next three years are to:

- build upon the platform of ESRC's strong relationship with the users of social science research and move it on to the next logical stage: the development, through national partnerships, of new mechanisms for evidence-based policy;

56 The ESRC supports research and related training which underpins the economic and quality of life factors in the UK - environmental and health care, sustainable agriculture and food production, energy and environmental protection. The UK's science and engineering base has weaknesses which could be mitigated by research. Development in products design and engineering is essential to growth in the UK economy. From world class research the potential to be realised is only in a limited number of areas - sustainable development, The recent restructuring of the ESRC's research, education, professional and policy research and policy research has seen the Council's research in these areas to be reorganised, and new opportunities arising. The ESRC's research and education are underpinned by the basic research in chemistry, physics, mathematics and engineering supported by the ESRC.

#### Specific Allocations

57 It is particularly important that the ESRC has the funds to respond to a sufficient proportion of the high quality proposals originating from the science base. The increased allocation will enable the Council to increase its level of support for responsive research grants over the next three years, as well as to increase support for research areas identified above and by the Council's committees which will expand and exploit the potential opportunities provided by the genomic revolution.

#### Objectives

- 58 New objectives for the Council over the next three years are to:
- increase the proportion of the ESRC budget committed to responsive research support to enable a higher proportion of internationally competitive research to be funded;
  - increase the proportion of the budget devoted to genomics research;
  - integrate further its activities with MRC and EPSRC.

RESEARCH COUNCIL		ECONOMIC AND SOCIAL	

2007-08	2008-09	2009-10	2010-11
10.475	11.175	11.175	11.175
2.450	2.450	2.450	2.450
10.475	11.175	11.175	11.175
10.475	11.175	11.175	11.175

#### Allocation

ESRC  
Cash income  
Post grant income

#### Strategic Direction

59 There is an increased economic and social dimension to research carried out in other areas of the Science and Engineering base. Sustainable growth and quality of life are dependent on the behaviour of people and their response to the technology.

#### Specific Allocations

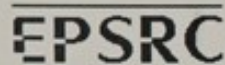
60 Additional funding for the Millennium Cohort, a new cohort to collect lifetime data on those born in year 2002 and a range of areas has been included in the above allocation.

#### Objectives

- 61 The key new objectives for the Council over the next three years are to:
- build upon the platform of ESRC's strong relationship with the users of social science research and move it on to the next logical stage: the development, through national partnerships, of new mechanisms for evidence-based policy;



- strengthen Britain's social science base and encourage new and original thinking through increased support for research grants, doctoral studentships and key data resources;
- focus major investments on the emerging research agenda of 21<sup>st</sup> Century, which will often - as in the case of revolutionary developments in the medical and biological sciences - cross conventional Research Council and subject boundaries.



## ENGINEERING AND PHYSICAL SCIENCES RESEARCH COUNCIL

### Allocation

	£M	£M	£M	£M
	1998-99	1999-00	2000-01	2001-02
EPSRC	382.982	397.584	410.850	427.179
Cash Increase		3.81%	7.28%	11.54%
Real terms Increase		1.18%	2.01%	3.47%

### Strategic Direction

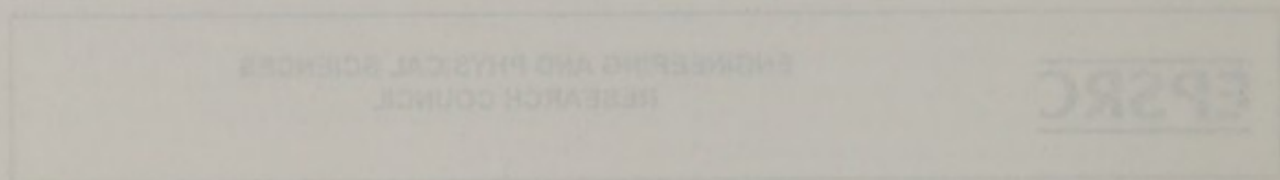
62. The EPSRC has the responsibility for ensuring the **health of the major scientific disciplines**, mathematics, physics, chemistry and engineering, which form the basis for progress across the full span of scientific endeavour. In new initiatives, it will be important to ensure that EPSRC basic programmes evolve in such a way that they contribute fully and effectively to the research of the Medical Research Council and of the Biotechnology and Biological Sciences Research Council. A vital step in this process is that the concerns and ambitions of the life sciences be fully recognised as part of the context within which the basic programmes of the EPSRC are conducted.

### Specific allocations

63. The above allocations include £60 million over three years to increase those programmes that underpin those of the BBSRC, MRC and NERC including initiatives to:

- ensure that the **classical sciences underpinning progress in the life sciences are reinforced**. The application of mathematics to theoretical biology, of physics to health studies (diagnostic techniques) and of chemistry (combinatorial chemistry, biocatalysis, novel molecular synthesis, protein chemistry and structure) to the biological sector are examples of the rich and promising contributions to be made;
- encourage **multidisciplinary work at the interface between the life sciences and the physical sciences** such as:
  - the application of information technology in bioinformatics and in the data and information management associated with ongoing research in the life sciences (the Genome programme);
  - biochemical engineering where new generations of reactions must be translated to the appropriate scale and reliability;
  - the extension of materials science into organic and living systems. The ability to take advantage of greater medical understanding will, in many instances, depend upon parallel advances in materials science and engineering;
  - ensure that training schemes such as the Advanced Fellowship give full recognition to the crucial contribution of multidisciplinary understanding at the life sciences/physical sciences interface.

- strengthen Britain's social science base and encourage new and original thinking through research subject for research grants, academic appointments and research contracts.
- focus major investments on the growing research agenda of the 21st century, which will cover a wide range of revolutionary developments in the physical and biological sciences, social and medical research, and subject disciplines.



1995-96	1994-95	1993-94	1992-93
£10.5m	£10.5m	£10.5m	£10.5m
£10.5m	£10.5m	£10.5m	£10.5m
£10.5m	£10.5m	£10.5m	£10.5m
£10.5m	£10.5m	£10.5m	£10.5m

EPSRC  
Engineering and Physical Sciences Research Council

### Strategic Direction

The EPSRC has the responsibility for ensuring the health of the major scientific disciplines in engineering, physics, chemistry and engineering, which form the basis for progress across the full span of scientific endeavour. In new initiatives, it will be important to ensure that EPSRC basic programmes evolve in such a way that they contribute fully and effectively to the research of the Medical Research Council and of the Biological Sciences Research Council. A vital step in this process is that the concerns and interests of the life sciences be fully recognised as part of the context within which the basic programmes of the EPSRC are conducted.

### Specific Initiatives

The above allocations include £10 million over three years to initiate three programmes that include research of the EPSRC, MRC and NERC including initiatives for:

- ensure that the classical sciences underpinning progress in the life sciences are reinforced. This includes the application of mathematics to the study of physics in health studies (diagnostic techniques) and the application of chemistry to the study of biology, protein synthesis, protein chemistry and structural biology. The biological sector is expected to make a major contribution to the life sciences.
- encourage multidisciplinary work at the interface between the life sciences and the physical sciences such as:
- the application of information technology in biomedicine and in the data and information management associated with ongoing research in the life sciences (the genome programme);
- biomedical engineering where new generations of research must be translated to the appropriate scale and industry;
- the extension of materials science into organic and living systems. The ability to take advantage of greater medical understanding will in many instances depend upon parallel advances in materials science and engineering;
- ensure that training schemes such as the Advanced Research Fellowships give full recognition to the crucial contribution of multidisciplinary understanding at the interface between the life sciences and the physical sciences.

## Objectives

64. Key new objectives for the Council over the next three years are to:

- enhance support for basic research in the key disciplines underpinning the programmes of BBSRC, MRC and NERC;
- enhance support for joint programmes with the BBSRC;
- enhance the support for the highest quality basic research in engineering.

## Strategic Direction

The overall thrust of the Medical Research Council's research portfolio is to improve the health of the nation. The MRC are constrained by the need to maintain some expertise in most health areas and will continue to support research in the main fields of: molecules and cells, genetics and health, infectious and immunity, public health and health services, organs and systems, neuroscience and mental health, and nutrition and environment. In these three fields, priority for new investment will be directed towards establishing the infrastructure to underpin the next generation work, encouraging research into difficult problems, continuing a special programme on orphan diseases and strengthening multidisciplinary groups studying the biological and ecological processes underlying health problems. The MRC programmes are underpinned by the basic research in chemistry, physics, mathematics and engineering supported by EPSRC.

## Specific Allocations

The above allocations include £12m capital to fund the creation of DNA bank databases.

## Objectives

67. Key new objectives for the Council over the next three years are to:

- maintain the UK position at the forefront of post-genome research;
- enhance the evidence-base for the cost-effective provision of health care and improvement of public health;
- continue to enhance synergy with other Research Councils and the charities.



Objectives

Key new objectives for the Council over the next three years are to:

- enhance support for basic research in the key disciplines underpinning the programme of BSERC, MRC and NERC;
- enhance support for joint programmes with the BSERC;
- enhance the support for the highest quality basic research in engineering.



## MEDICAL RESEARCH COUNCIL

### Allocation

Medical Research Council  
Cash Increase  
Real terms Increase

£M	£M	£M	£M
1998-99	1999-00	2000-01	2001-02
290.208	304.538	319.173	334.068
	4.94%	9.98%	15.11%
	2.28%	4.58%	6.79%

### Strategic Direction

65. The overall thrust of the Medical Research Council's research portfolio is to improve the health of the nation. The MRC are constrained by the need to maintain some expertise in most health areas and will continue to support research in the main fields of: molecules and cells, genetics and health, infections and immunity, public health and health services, organs and cancer, neuroscience and mental health and nutrition and environment. Within these fields, priority for new investment will be directed towards establishing the infrastructure to underpin the post genome work, encouraging research into antibiotic resistance, continuing a special programme on spongiform encephalopathies and strengthening multidisciplinary groups studying the biological and sociological processes underlying health inequalities. The MRC programmes are underpinned by the basic research in chemistry, physics, mathematics and engineering supported by EPSRC.

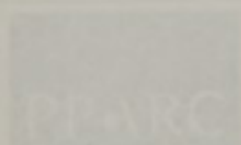
### Specific Allocations

66. The above allocations include £12m capital to fund the creation of DNA tissue database.

### Objectives

67. Key new objectives for the Council over the next three years are to:

- maintain the UK position at the forefront of post-genome research;
- enhance the evidence-base for the cost-effective provision of health care and improvement of public health;
- continue to enhance synergy with other Research Councils and the charities.



## PARTICLE PHYSICS AND ASTRONOMY RESEARCH COUNCIL

### Allocation

PPARC TOTAL  
Total Cash Budget  
PPARC - Domestic Programmes  
Cash Increase - Domestic Programmes  
Real Terms Increase - Domestic Programmes

£M	£M	£M
1998-99	1999-00	2000-01
100.000	102.000	105.000
2.0%	2.0%	2.9%
0.0%	0.0%	0.0%

# Allocation

Medical Research Council  
Cash Income  
£10.1m increase

2010	2011	2012	2013
£10.1m	£10.1m	£10.1m	£10.1m
£10.1m	£10.1m	£10.1m	£10.1m
£10.1m	£10.1m	£10.1m	£10.1m
£10.1m	£10.1m	£10.1m	£10.1m

## Strategic Direction

66 The overall thrust of the Medical Research Council's research portfolio is to promote the health of the nation. The MRC are constrained by the need to maintain some expertise in most health areas and will continue to support research in the most fields of: microbes and cells, genetics and health, infectious and immunity, brain and health services, organs and cancer, neuroscience and mental health and nutrition and environment. Within these fields priority for new investment will be directed towards addressing the challenges to achieve the best genome work, encouraging research into antibiotic resistance, combining a whole systems approach, encouraging and strengthening multidisciplinary groups studying the biological and sociological processes underlying health inequalities. The MRC programmes are supported by the basic research in chemistry, physics, mathematics and engineering supported by EPSRC.

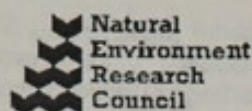
## Specific Allocations

67 The above allocations include £12m capital to fund the creation of DNA bank database

## Objectives

- 68 Key new objectives for the Council over the next three years are to:
- maintain the UK position at the forefront of post genome research;
  - enhance the evidence-base for the cost-effective provision of health care and improvement of public health;
  - continue to enhance synergy with other Research Councils and the charities





## NATURAL ENVIRONMENT RESEARCH COUNCIL

### Allocation

	£M	£M	£M	£M
	1998-99	1999-00	2000-01	2001-02
<b>NERC</b>	168.819	178.530	181.757	187.457
Cash Increase		4.89%	7.66%	11.04%
Real terms Increase		2.23%	2.38%	3.01%

\* NERC for 1998-99 have been adjusted for cash flow changes to show the underlying baseline.

### Strategic Direction

68. NERC's top strategic priorities beyond existing priorities and the need to sustain the long term health of the science base are: climate science beyond Kyoto; and the genome and the environment. The growing importance of the climate agenda to industry and government has raised urgent new challenges for fundamental climate science. There is a need to build on the UK's current world leadership and establish new interdisciplinary capabilities.

69. There is also a need to link molecular and structural biology with ecology and evolutionary biology in programmes to interpret the genome as the molecular basis of adaptation. Such programmes will establish a new community of scientists able to capitalise on genomic data and will develop evolutionary biotechnology as an alternative to bio-prospecting for the identification of novel products.

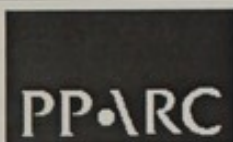
### Specific Allocations

70. New programmes will address three main areas: understanding the carbon budget and hence mitigation policies; improving regional predictions of climate change; and integrating social, economic and engineering dimensions into climate science (with ESRC and EPSRC).

### Objectives

71. Key new objectives for the Council over the next three years are to:

- maintain the long term health of the science base for the sciences of the environment;
- develop a climate research agenda, including joint work with EPSRC and ESRC;
- enhance understanding of the genome and the environment.

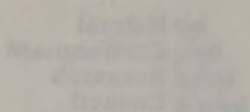


## PARTICLE PHYSICS AND ASTRONOMY RESEARCH COUNCIL

### Allocation

	£M	£M	£M	£M
	1998-99	1999-00	2000-01	2001-02
<b>PPARC TOTAL</b>	194.220	196.306	200.687	204.228
Total Cash Increase		1.82%	3.33%	5.15%
<b>PPARC - Domestic Programme</b>	97.600	100.536	102.861	105.790
Cash Increase - Domestic Programme		3.0%	5.4%	8.4%
Real Terms Increase - Domestic Programme		0.40%	0.21%	0.55%

Cash figures are equivalent to level funding of the domestic programme in real terms.

	<b>NATURAL ENVIRONMENT RESEARCH COUNCIL</b>
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#### Allocation

1995-96	1994-95	1993-94	1992-93
£m	£m	£m	£m
18.7	18.7	18.7	18.7
1.4	1.4	1.4	1.4
17.3	17.3	17.3	17.3

\*NERC for 1995-96 have been adjusted for cash flow changes to allow the country's deficit.

#### Strategic Direction

99. NERC's top strategic priorities beyond existing priorities and the need to sustain the long term health of the science base are: climate science beyond Kyoto; and the genome and the environment. The growing importance of the climate agenda to industry and government has raised urgent new challenges for fundamental climate science. There is a need to build on the UK's current world leadership and establish new interdisciplinary opportunities.

98. There is also a need to link molecular and structural biology with ecology and evolutionary biology in programmes to integrate the genome as the molecular basis of adaptation. Such programmes will establish a new community of scientists able to capitalise on genomic data and will develop evolutionary technology as an alternative to bio-protecting for the identification of novel products.

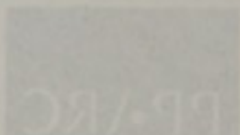
#### Specific Allocations

97. New programmes will address three main areas: understanding the carbon budget and heat mitigation points; improving regional conditions of climate change; and integrating social, economic and engineering dimensions into climate science (with ESRC and EPSRC).

#### Objectives

96. The new objectives for the Council over the next three years are to:

- maintain the long term health of the science base for the science of the environment;
- develop a climate research agenda, involving joint work with EPSRC and ESRC;
- enhance understanding of the genome and the environment.

	<b>PARTICLE PHYSICS AND ASTRONOMY RESEARCH COUNCIL</b>
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#### Allocation

1995-96	1994-95	1993-94	1992-93
£m	£m	£m	£m
104.3	104.3	104.3	104.3
1.4	1.4	1.4	1.4
102.9	102.9	102.9	102.9

Cash flows are equivalent to zero funding of the domestic programme in 1995-96.

**Strategic Direction**

72. PPARC funds the UK subscription to CERN and the corresponding domestic investment to allow UK scientists to participate in CERN projects, especially the Large Hadron Collider (LHC), currently under construction. Together with the British National Space Centre, the Council also pays the UK contribution to the European Space Agency (ESA). PPARC also funds ground-based astronomy programmes centred around the UK telescope sites at La Palma and Hawaii, with support from the new Astronomy Technology Centre (ATC) in Edinburgh. The UK has contributed 25% of the costs of the Gemini project, to open two new telescopes on Hawaii and in Chile in 1999 and 2000 respectively.

**Specific Allocations**

73. As mentioned above, the allocations maintain the domestic programme in real terms. Funds have also been reserved to cover any additional costs of the international subscriptions arising from changes in exchange rates or relative Net National Income. Moreover, the domestic programme will benefit from the resources returned by concentrating all of the astronomy support at the ATC in Edinburgh.

**Objectives**

74. Key new objectives for the Council over the next three years are to:

- invest in the young scientific leaders of the future;
- maintain the UK at the forefront of astronomy by investing in new space missions, telescopes and other infrastructure;
- To maintain the leading role of UK particle physics in theoretical work, in the exploitation of existing experimental facilities, and in the construction of new detectors at CERN and elsewhere.

**Objectives**

75. Key new objectives for the Council over the next three years are to:

- improve the service it provides by identifying the needs of the science community to target future investment;
- maintain and improve the UK's position in the provision of international standard major physics facilities for the UK science communities;
- attain at least 90% user satisfaction ratings on its performance measures in terms of operating efficiency as measured in its user satisfaction surveys;
- attract 30% of its income from non-Research Council work within 5 years.



11. EPSRC funds the UK contribution to CERN and the corresponding domestic programme to allow UK scientists to participate in CERN's research, especially the Large Hadron Collider (LHC) currently under construction. Together with the European Space Agency (ESA), EPSRC also funds the UK contribution to the European Space Agency (ESA). EPSRC also funds the UK contribution to the new Astronomy Technology Centre (ATC) in Edinburgh. The UK has contributed 25% of the costs of the Giant project, to open the new telescope on Mount

## Future Initiatives

12. As mentioned above, the scientific research in the domestic programme is not large. Funds have not been allocated to cover any substantial costs of the international programmes arising from changes in strategies or to replace that national share. However, the domestic programme will benefit from the resources released by concentrating on the astronomy support at the ATC in Edinburgh.

## Objectives

13. Key new objective for the Council over the next three years are to:

- Invest in the young scientific leaders of the future;
- Position the UK at the forefront of astronomy by investing in new space missions, telescopes and other infrastructure;
- To maintain the leading role of UK particle physics in theoretical work, in the exploitation of existing experimental facilities, and in the construction of new detectors at CERN and elsewhere.



# COUNCIL FOR THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS

## Allocation

CCLRC

£M	£M	£M	£M
1998-99	1999-00	2000-01	2001-02
1.462	2.000	2.000	2.000

## Strategic Direction

75. CCLRC has a key role in providing the national facilities and technical expertise for very large instruments such as neutron and synchrotron x-ray sources and lasers. CCLRC operates for the benefit and use of the UK science community at large. The direct allocation to CCLRC must be viewed in the context of the approximately £100m income it receives from other sources, including the other Research Councils, which pays for the approximately 14,000 people who use the various CCLRC facilities. The success of the above approach will be measured in terms of the service and continued increase in use of its facilities both by the science base through the other Research Councils and direct industrial and Government projects.

## Specific Allocations

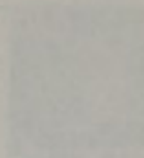
76. £6m over the CSR period, on projects to enhance the existing facilities the development of better instrumentation, support functions and scoping studies into potential new fields of work for existing and potential future instruments, devices and systems.

## Objectives

77. Key new objectives for the Council over the next three years are to:

- improve the service it provides by investigating the needs of the science community to target future investment;
- maintain and improve the UK's position in the provision of international standard major physics facilities for the UK science communities;
- attain at least 90% user satisfaction ratings on its performance monitors in terms of operating efficiency as measured in its user satisfaction surveys;
- attract 30% of its income from non Research Council work within 5 years.

COUNCIL FOR THE CENTRAL LABORATORY  
OF THE RESEARCH COUNCILS



Allocation

1990-91	1991-92	1992-93	1993-94
1.000	1.000	1.000	1.000
1.000	1.000	1.000	1.000
1.000	1.000	1.000	1.000

CCLRC

Strategic Direction

CCLRC has a key role in providing the national facilities and technical expertise for very large instruments such as neutron and synchrotron x-ray sources and lasers. CCLRC operates for the benefit and use of the UK scientific community at large. The direct allocation to CCLRC must be viewed in the context of the government's commitment to science and technology, including the other Research Councils, which pays for the operation of these facilities. The success of the various CCLRC facilities, the success of the science base through the use of its facilities and the continued increase in use of its facilities are the main measures of its success. Through Research Councils and direct industrial and Government projects.

Specific Allocations

Over the CCLRC period, on projects to enhance the existing facilities the development of better instrumentation, support functions and ongoing studies into potential new fields of work for existing and potential future instruments, devices and systems.

Objectives

Key new objectives for the Council over the next three years are to:

- improve the service it provides by investigating the needs of the science community to target future investment;
- maintain and improve the UK's position in the provision of international standard major service facilities for the UK science community;
- attain at least 90% user satisfaction ratings on its performance monitors in terms of operating efficiency as measured in its user satisfaction survey;
- attract 50% of its income from non Research Council work within 5 years.





# THE ROYAL SOCIETY

## Allocation

### Royal Society

Cash Increase

Real terms Increase

£M	£M	£M	£M
1998-99	1999-00	2000-01	2001-02
22.621	23.850	24.622	25.745
	5.43%	8.85%	13.81%
	2.76%	3.50%	5.58%

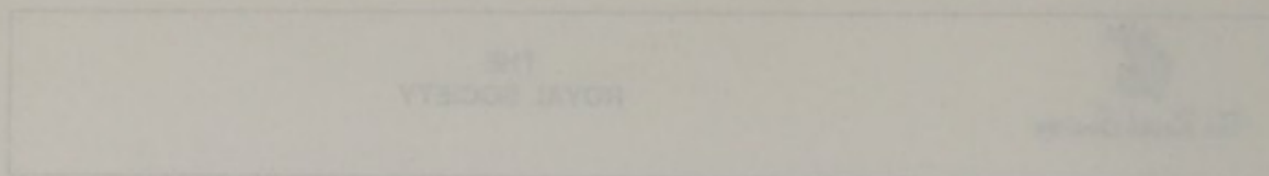
## Purpose of Government Funding

78. The Royal Society is an independent body, which also acts as the agent of Government to undertake a range of programmes and initiatives. Government funding is provided to fund these specific programmes and initiatives and does not support the full range of the Society's activities.

## Specific Allocations

79. Additional resources have been allocated the Royal Society's University Research Fellowship (URF) scheme which is directed towards truly outstanding people to whom the Nation will look to maintain our cadre of excellent university researchers as it diminishes through retirement (following the boost in recruitment in the 1960s). The existing 265 fellowships will be increased to 310.

80. Additional resources have been allocated to fund a further twelve *Dorothy Hodgkin Fellowships* bringing the total to 40, aimed at providing a first career step for excellent "new" postdoctoral scientists, bearing in mind that the period immediately after the completion of the PhD is when women are most likely to drop out of careers in science and engineering.



1994-95	1995-96	1996-97	1997-98
12.100	12.100	12.100	12.100
12.100	12.100	12.100	12.100
12.100	12.100	12.100	12.100
12.100	12.100	12.100	12.100

Allocation  
Royal Society  
Science Support  
1994-95 to 1997-98

# Programme of Government Funding

10. The Royal Society is an independent body which acts as the agent of Government to undertake a range of programmes and initiatives. Government funding is provided to fund these specific programmes and initiatives and does not support the full range of the Society's activities.

## Specific Allocations

11. Additional resources have been allocated to the Royal Society's University Research Fellowship (URF) scheme which is directed towards early outstanding people to whom the Nation will look to maintain our cadre of research university researchers as it diminishes through retirement. Following the point in retirement in the 1990s, the existing 100 fellowships will be increased to 210.

12. Additional resources have been allocated to fund a further twenty-two University Research Fellowships bringing the total to 22, aimed at providing a fast career step for excellent "new" postdoctoral scientists. Funding is aimed at the first year immediately after the completion of the PhD so when women are most likely to drop out of careers in science and engineering.



## THE ROYAL ACADEMY OF ENGINEERING

### Allocation

#### Royal Academy of Engineering

Cash Increase

Real terms Increase

£M	£M	£M	£M
1998-99	1999-00	2000-01	2001-02
3.436	3.706	4.025	4.270
	7.86%	17.14%	24.27%
	5.12%	11.39%	15.29%

### Purpose of Government Funding

81. As with the Royal Society, the Royal Academy of Engineering is an independent body, which also acts as the agent of Government to undertake a range of programmes and initiatives. Government funding is provided to fund this range of specific programmes and initiatives and does not support the full range of the Academy's activities. Government funding is intended to enable the Royal Academy of Engineering to reinforce success through the creation of centres of engineering excellence to promote overall quality within the SEB.

### Specific Allocations

82. The above allocations include funding for increased numbers of Industrially-Linked Research Fellowships, Visiting Professorships In Engineering For Sustainable Development and Advanced Research Fellowships.

#### Secretary of State's University/Industry Partnership Funds


83. These funds recognise those university science and engineering departments, centres and units which have made substantial progress in developing research partnerships with industry. Government is committed to initiatives funding for such outstanding research and the wider world.

- to provide incentives for building lasting research partnerships between UK universities and industry
- the promotion of partnerships for improving the quality of life as well as benefiting the economy.

84. DSE's research budget, which totals £2,750, £2,750, £3,000, which over the period is also used for subgrants to commercial bodies, projects or schemes designed to encourage collaboration between industry and academia, reflects a specific area of Government's policy on R&D.



THE  
ROYAL ACADEMY OF ENGINEERING



Appendix

2010-11	2011-12	2012-13	2013-14
£1,100,000	£1,100,000	£1,100,000	£1,100,000
£1,100,000	£1,100,000	£1,100,000	£1,100,000
£1,100,000	£1,100,000	£1,100,000	£1,100,000
£1,100,000	£1,100,000	£1,100,000	£1,100,000

Royal Academy of Engineering

Chairman

Prof. Sir John Hines

### Programme of Government Funding

As with the Royal Society, the Royal Academy of Engineering is an independent body, which acts as the agent of Government to undertake a range of programmes and initiatives. Government funding is provided to the Academy in a number of ways, including through the award of specific grants and awards. The Academy's programme of government funding is intended to enable the Royal Academy of Engineering to deliver a range of activities through the creation of centres of engineering excellence to promote growth within the SME.

### Specific Initiatives

The above initiatives include funding for increased numbers of studentships, fellowships, research fellowships, visiting professorships in engineering for Sustainable Development and Advanced Research Fellowships.

## CENTRALLY FUNDED ITEMS



Office of Science and Technology

OFFICE OF SCIENCE AND TECHNOLOGY  
INITIATIVES*Public Understanding of Science*

83. The OST has specific responsibilities for promoting the Public Understanding of Science, Engineering and Technology and to highlight its vital role in boosting UK competitiveness and improving the quality of life. An example of the various approaches to engaging the public is the annual SET week, where over a million people attend events throughout the country. OST's central role in encouraging best practice within the science communication community includes leading a project to develop a means for evaluating public understanding. The purpose of this is to establish a national picture of public understanding encompassing the contributions not only of organisations funded through the Science Budget but the many other private and public sector contributors.

*Women In Science*

84. The OST unit for the Promotion of Women in Science, Engineering and Technology provides pump-priming funds for new initiatives in co-operation with other organisations in the field.

*International Collaborations*

85. Provision is made for contributions to joint programmes with other governments, aimed at strengthening international scientific collaboration and promoting the exchange of ideas and information.

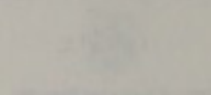
*Secretary of State's University/Industry Partnership Prizes*

86. These prizes recognise those university science and engineering departments, centres and units who have made outstanding progress in developing research partnerships with industry. Emphasis is on growth in industry funding for basic and strategic research and the prizes reward:

- successful strategies for building lasting research partnerships between UK universities and industry
- the potential of partnerships for improving the quality of life as well as benefiting the economy.

87. OST initiatives budget, which totals £2.750, £2800, £2.850 million over the period is also used for: subscriptions to international bodies; projects or schemes designed to encourage collaboration between industry and academia; reviews of specific areas of Government's policy on SET.

OFFICE OF SCIENCE AND TECHNOLOGY  
INITIATIVES



Public Understanding of Science

23. The OST has specific responsibilities for promoting the Public Understanding of Science, Engineering and Technology and to support its work in promoting the competitiveness and improving the quality of life. An example of the work undertaken is engaging the public in the annual SET week, which over a three day period gives the public the chance to engage with the OST's work and to encourage local groups within the science community to develop a project to develop a theme for evaluating public understanding. The purpose of this is to achieve a range of public understanding programmes for the community and to encourage the public to contribute to the development of the many other public and public sector initiatives.

Women in Science

24. The OST and for the Promotion of Women in Science, Engineering and Technology provides ongoing funding for new initiatives in co-operation with other organisations in the field.

Interagency Collaborations

25. Progress is made for collaboration to joint programmes with other government, aimed at strengthening inter-agency scientific collaboration and promoting the exchange of ideas and information.

Secretary of State's University/Industry Partnership Prize

26. These prizes recognise those university science and engineering departments, centres and units who have made outstanding progress in developing research partnerships with industry. Emphasis is on growth in industry funding for basic and strategic research and the prizes reward:

- successful strategies for building lasting research partnerships between UK universities and industry
- the potential of partnerships for improving the quality of life as well as benefiting the economy.

27. OST initiatives budget which totals £3.750, £3.500, £3.500 million over the period is also used for support to international bodies, projects or schemes designed to encourage collaboration between industry and academic research of specific areas of Government's policy on SET.



## Superannuation Supplement

### ALLOCATION BY FUNDED BODY

88. Prior to 1994, there were a number of separate arrangements for the payment of pensions to the Research Councils. In 1994 the Research Councils' Pension Scheme (RCPS) was established and subsumed the earlier arrangements for all of the Councils except MRC, which continues as a funded scheme. The benefits of the RCPS are analogous to those of the Principle Civil Service Pension Scheme. The RCPS, like the closed schemes which preceded it, is funded on a pay as you go basis from the Accruing Superannuation Liability Charges (ASLC) paid by the Research Councils with any shortfall being funded directly from the Science Budget. These allocations set aside £11.991, £14.368, £14.750 million for this purpose.

## Exchange Rate And Contingency Reserve

89. Since 1994, variation in the ESA and CERN subscriptions caused by changes in Net National Income or exchange rates have been top sliced from the Science Budget as a whole and hence borne by all Research Councils rather than by PPARC alone. £33 million over the period has been set aside for this.

90. In 1996 agreement was reached at the ESA Council to freeze the budget of the Science Programme in cash terms for the next 5 years, and only compensate for inflation to the extent that it is above 3%.

91. As a result of a further joint UK-German initiative, it has been agreed that, compared to the 1994 agreement, the CERN budget should be reduced by 7.5% in 1997, by 8.5% in the years 1998-2000 and by 9.3% thereafter. These benefits accrue directly to the PPARC domestic budget.

Table 1	£M	£M	£M	£M
	1998-99	1999-00	2000-01	2001-02
EBSRC	155.728	158.295	202.904	208.108
ESRC	65.052	69.754	71.174	72.901
EPSRC	302.982	307.584	410.880	427.172
MRC	290.305	304.532	318.173	334.068
NERC	108.212	178.531	181.753	187.452
PPARC*	184.725	186.304	200.883	204.225
International Contingency	2.028	15.185	15.000	15.000
COLRC	1.463	2.000	2.000	2.000
Royal Society	22.621	23.850	24.622	25.745
Royal Academy of Engineering	3.438	3.700	4.025	4.270
OST Initiatives	2.376	2.750	2.891	2.890
Superannuation Supplement	13.204	11.991	14.368	14.750
Foresight/UK Awards	1.070	1.000	3.000	4.000
University Challenge		10.000	10.000	
DIAMOND			15.000	20.000
Joint Research Equipment Initiative	4.162	7.000	10.000	10.000
Joint Infrastructure Fund		75.000	100.000	125.000
TOTAL	1,339,379	1,473,123	1,587,450	1,657,637



## ALLOCATION BY FUNDED BODY

Figure 1

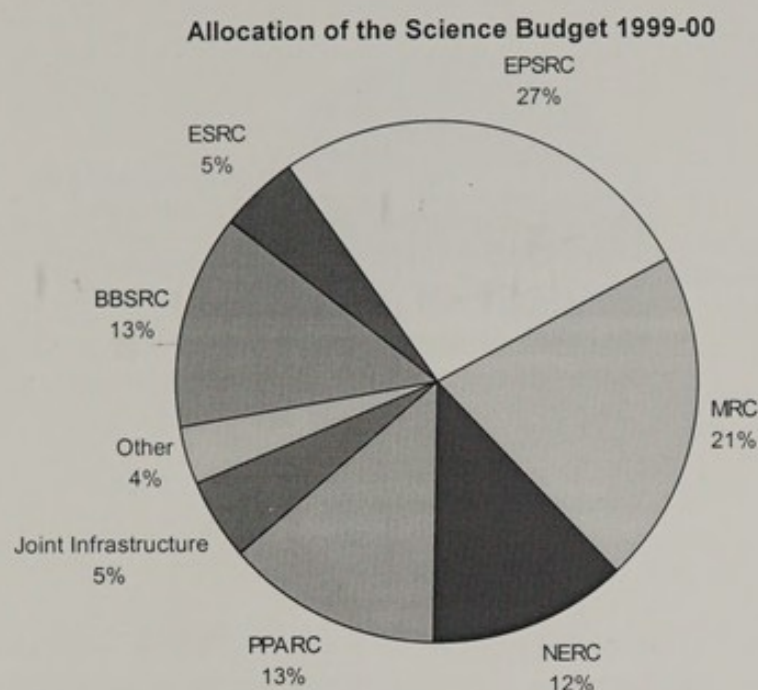


Table 1	£M	£M	£M	£M
	1998-99	1999-00	2000-01	2001-02
BBSRC	185.739	198.299	202.994	208.189
ESRC	65.990	69.754	71.174	72.901
EPSRC	382.982	397.584	410.850	427.179
MRC	290.208	304.538	319.173	334.068
NERC *	168.819	178.530	181.757	187.457
PPARC *	194.220	196.306	200.687	204.228
International/Contingency	3.028	(9.185)	15.000	15.000
CCLRC	1.462	2.000	2.000	2.000
Royal Society	22.621	23.850	24.622	25.745
Royal Academy of Engineering	3.436	3.706	4.025	4.270
OST Initiatives	2.376	2.750	2.800	2.850
Superannuation Supplement	12.298	11.991	14.368	14.750
ForesightLINK Awards	1.000	1.000	3.000	4.000
University Challenge		10.000	10.000	
DIAMOND			15.000	20.000
Joint Research Equipment Initiative	4.147	7.000	10.000	10.000
Joint Infrastructure Fund		75.000	100.000	125.000
<b>TOTAL</b>	<b>1,338.326</b>	<b>1,473.123</b>	<b>1,587.450</b>	<b>1,657.637</b>



ALLOCATION BY FUNDED BODY

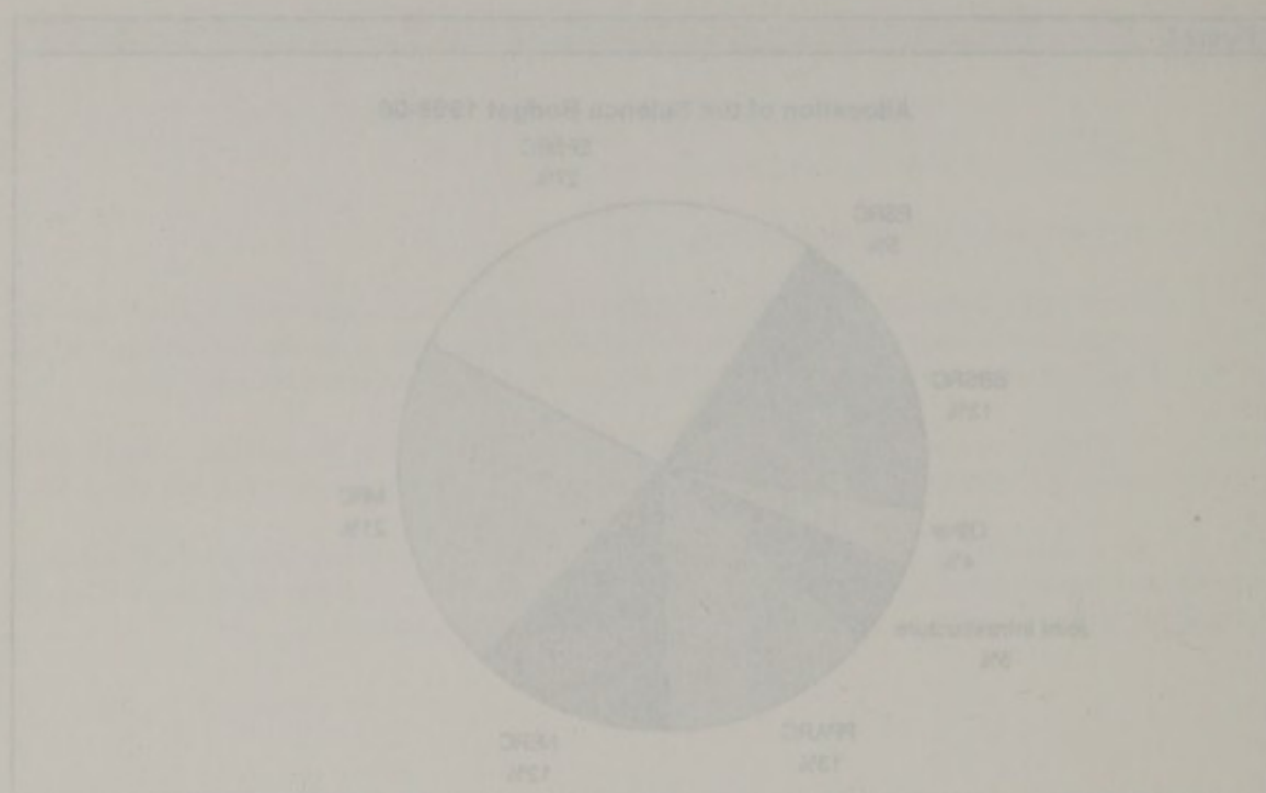
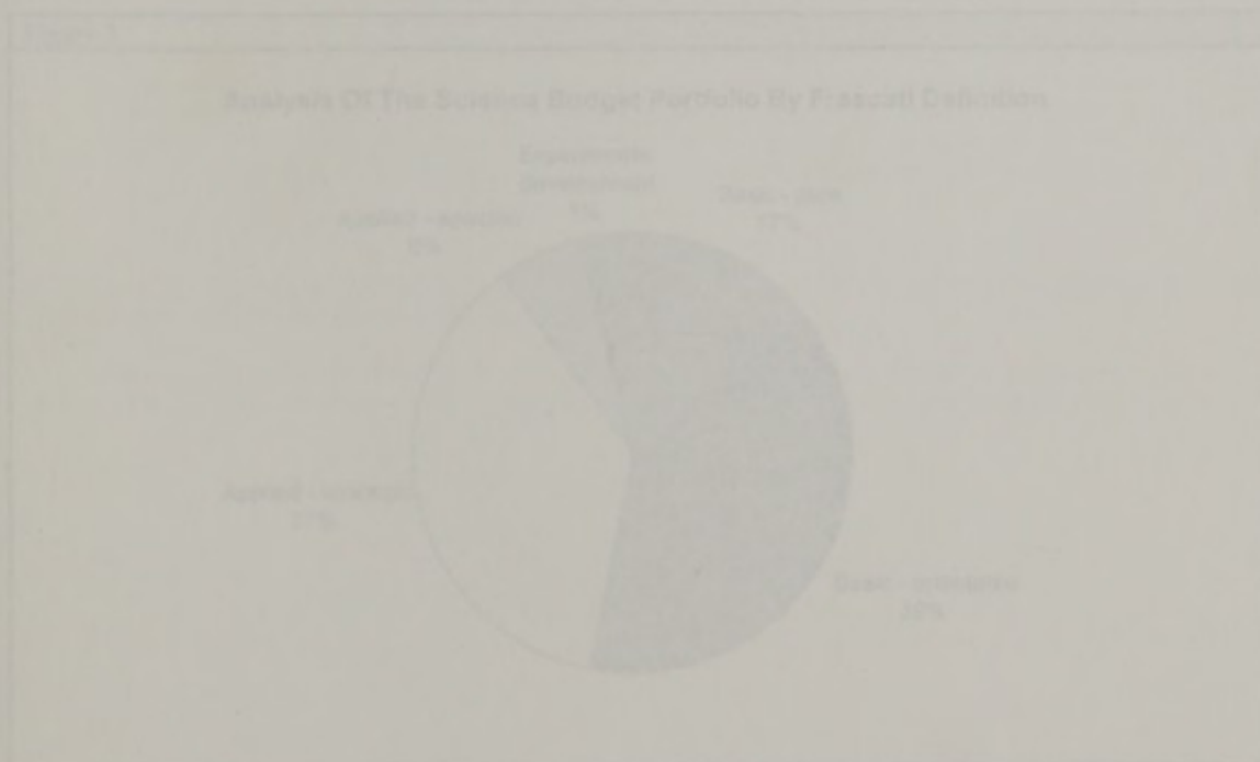
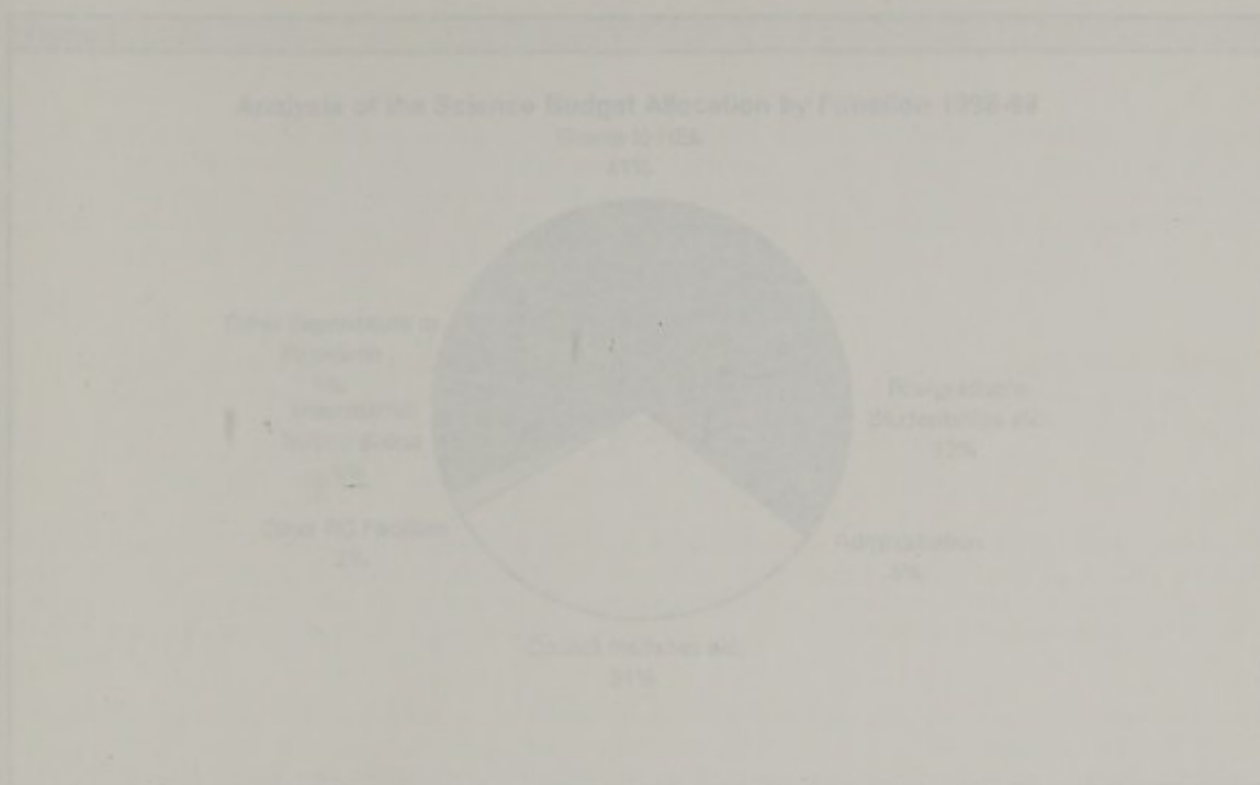


Table 1	1995-96	1996-97	1997-98	1998-99
TOTAL	1,338,358	1,472,123	1,587,488	1,687,887
Joint Infrastructure Fund	75,000	100,000	100,000	125,000
Joint Research Equipment Initiative	4,141	7,000	10,000	10,000
DIAMOND		18,000	18,000	20,000
University Challenge	1,000	10,000	10,000	10,000
Foreign LINK Awards	1,000	1,000	1,000	4,000
Supernatural Supplement	12,266	11,881	14,388	14,750
OST Initiative	2,370	2,750	2,800	2,850
Royal Academy of Engineering	3,430	3,700	4,025	4,250
Royal Society	22,827	23,800	24,802	28,745
CCRC	1,482	2,000	2,000	2,000
International Contingency	3,028	19,188	18,000	18,000
NERC	198,816	178,230	200,087	204,238
NERC	198,816	178,230	181,783	187,457
MRC	200,208	204,828	218,173	224,088
EPSRC	282,882	287,881	310,850	327,772
EPSRC	282,882	287,881	310,850	327,772
BBSRC	188,722	188,348	202,584	208,188

\* NERC and PPARC figures for 1998-99 have been adjusted for cash flow changes to show the underlying baseline

#### ALLOCATION BY MODE OF SUPPORT



#### THE POLICY AND OPERATING FRAMEWORK

The policy framework for the Research Councils is determined by Government which sets broad priorities between science and other areas of activity. Within that framework, and in keeping with the Code Principle governing total, 50 years total, day to day decisions on scientific matters are taken by the Research Councils.

This system is well established and will continue to be confirmed by Government. This is reflected in some key statements:





## ALLOCATION BY MODE OF SUPPORT

Figure 2

## Analysis of the Science Budget Allocation by Function 1998-99

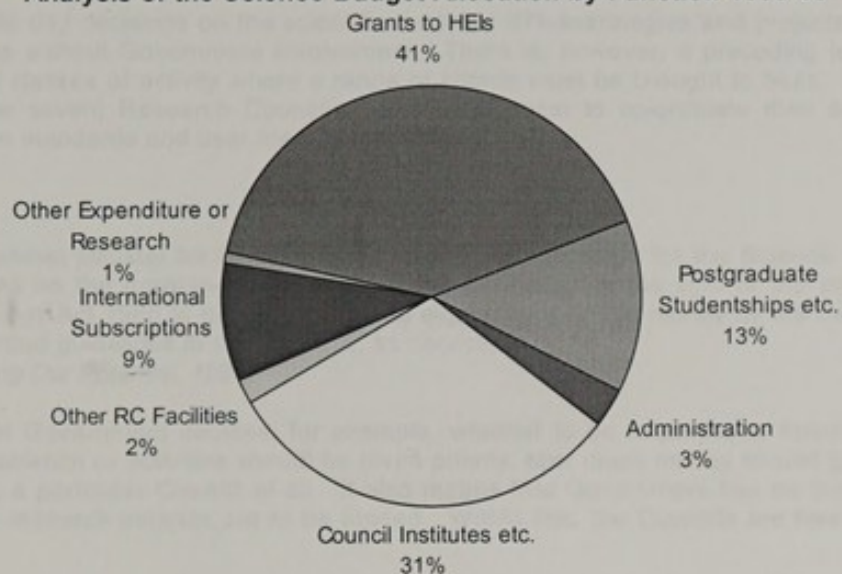
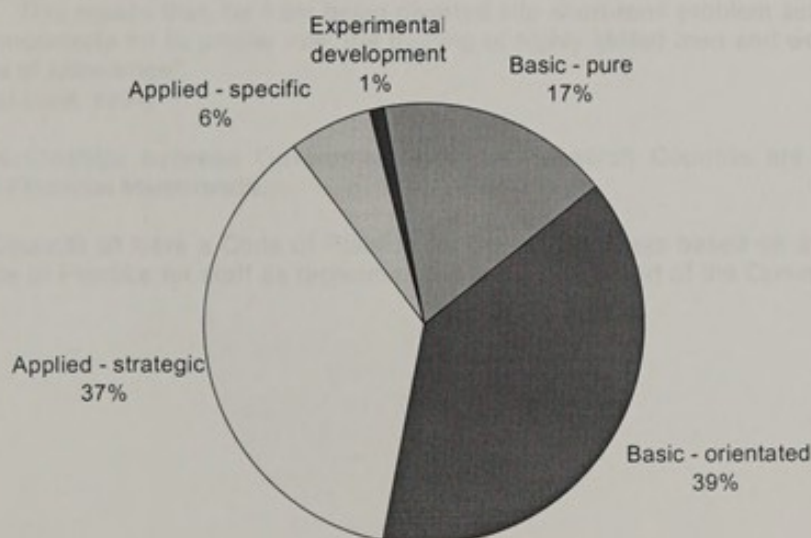


Figure 3

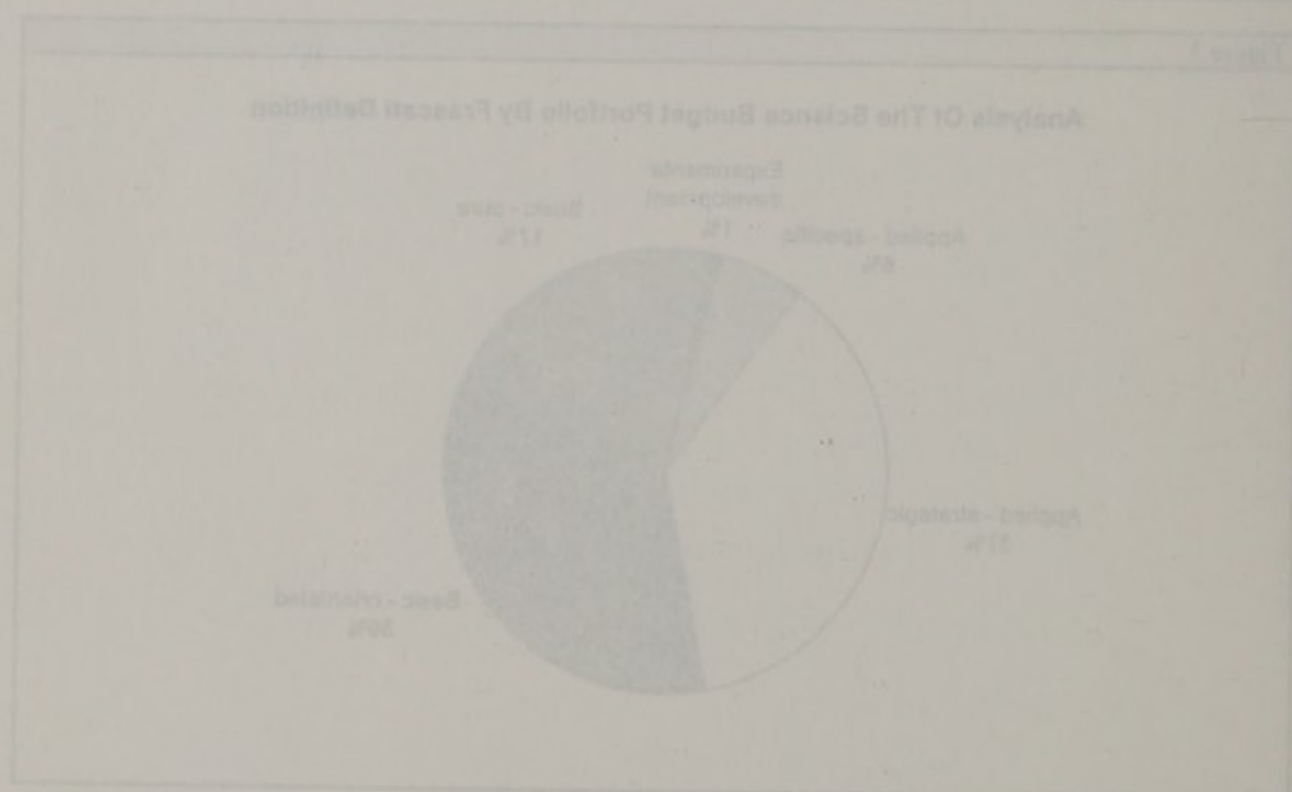
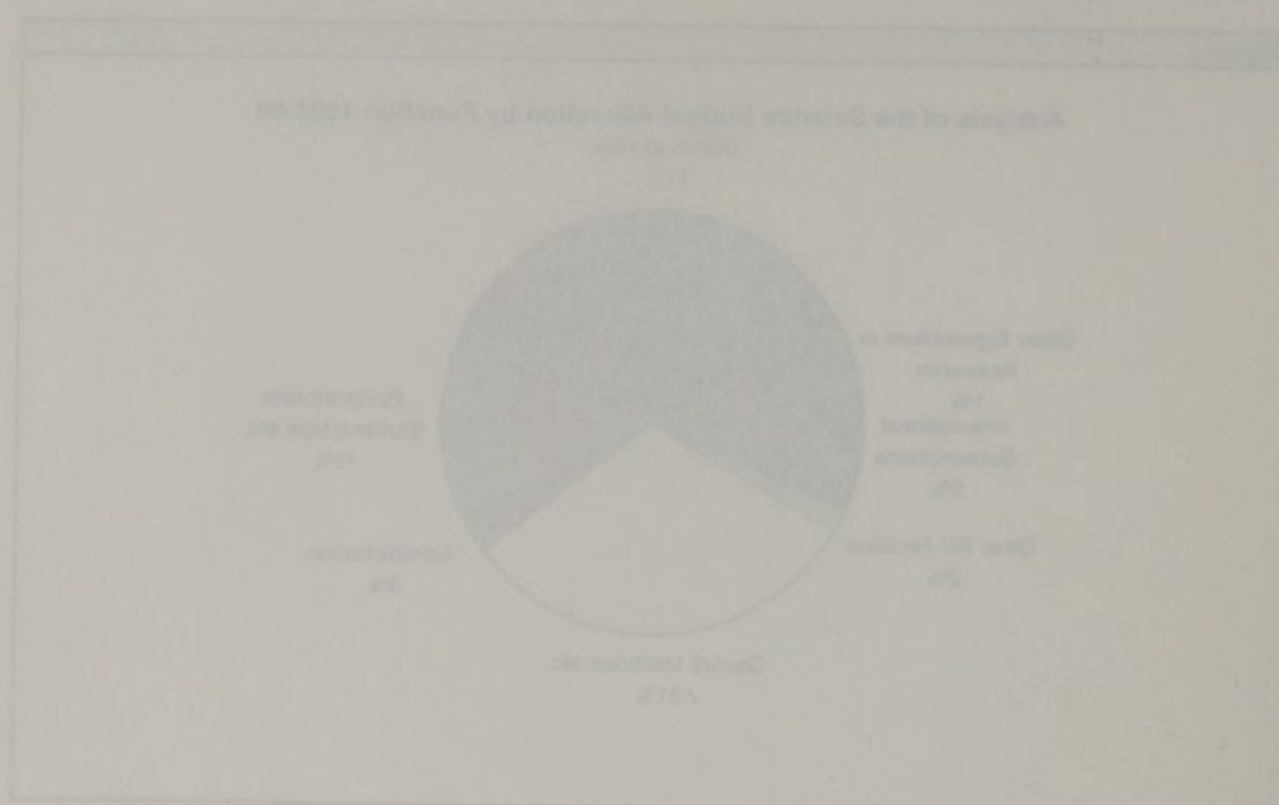
## Analysis Of The Science Budget Portfolio By Frascati Definition



## THE POLICY AND OPERATING FRAMEWORK

The policy framework for the Research Councils is determined by Government which sets broad priorities between several classes of activity. Within that framework, and in keeping with the Maudslayi Principle (formulated nearly 80 years ago), day to day decisions on scientific merits are taken by the Research Councils.

This system is well established and continues to be confirmed by Government. This is reflected in some key statements:



## THE POLICY AND OPERATING FRAMEWORK

The policy framework for the Research Councils is determined by Government action and broad choices between various classes of activity. Within that framework, and in keeping with the broad framework, the Research Councils day-to-day decisions on scientific matters are taken by the Research Councils.

This system is well established and continues to be confirmed by Government. This is reflected in the following:

- "The Secretary of State may, out of monies provided by Parliament, pay to any of the Research Councils, such sums in respect of the expenses of the Council as he may with the consent of the Treasury determine, and so far as relates to the use of expenditure sums so paid the Council shall act in accordance with such directions as may from time to time be given to it by the Secretary of State."  
(*Science and Technology Act, 1965*)
- "...day to day decisions on the scientific merits of different strategies and projects should be taken by the Research Councils without Government involvement. There is, however, a preceding level of broad priority setting between general classes of activity where a range of criteria must be brought to bear. There is also a need in a system with six [now seven] Research Councils, for a mechanism to co-ordinate their activities and ensure that they apply common standards and user friendly methods."

and

- "The Cabinet Minister for Science is responsible for the strategy for the Science Budget. He will continue to make decisions on the grant-in-aid for each of the Councils. In the light of the powers given him by the Science and Technology Act 1965 to direct the use and expenditure of that money by the Councils, he will continue to be ready to issue broad guidelines to the Councils, as necessary."  
(*Realising Our Potential, 1993*)

That means that Government decides, for example, whether to be in particular International Collaborations, whether some broad areas of science or activities should be given priority, how much money should go to each Council and indeed whether there should be a particular Council at all. It also means that Government has no involvement in deciding which people or which particular research projects are to be funded. Within this, the Councils are free - and are expected - to set their own policies.

"Realising Our Potential" went on to say that the Government wished to harness the intellectual resources of the Science and Engineering Base to improve economic performance and quality of life. This meant that decisions on priorities for support should be more clearly related to meeting the country's needs and enhancing the nation's wealth creating capacity. Relevance should therefore be taken into account, but in a context where long-term strategic and basic research is valued.

- "This is not to say that the Science and Engineering Base should be converted into short-term problem solvers for industrial customers. Industry does not want that; and nor does the Government intend to encourage or allow such a development. Rather, the Government intends to promote an effective partnership to the mutual benefit of all parties. This means that, far from being diverted into short-term problem solving, the Science and Engineering Base must concentrate on its proper role: the training of highly skilled men and women and the conduct of research at the frontiers of knowledge".  
(*Forward Look, 1994*)

The working relationships between Government and the Research Councils are formalised in combined Management Statements and Financial Memoranda.

The Research Councils all have a Code of Practice for Council Members based on a model prepared by HM Treasury. They also have a Code of Practice for staff as recommended in the first report of the Committee on Standards in Public Life.



