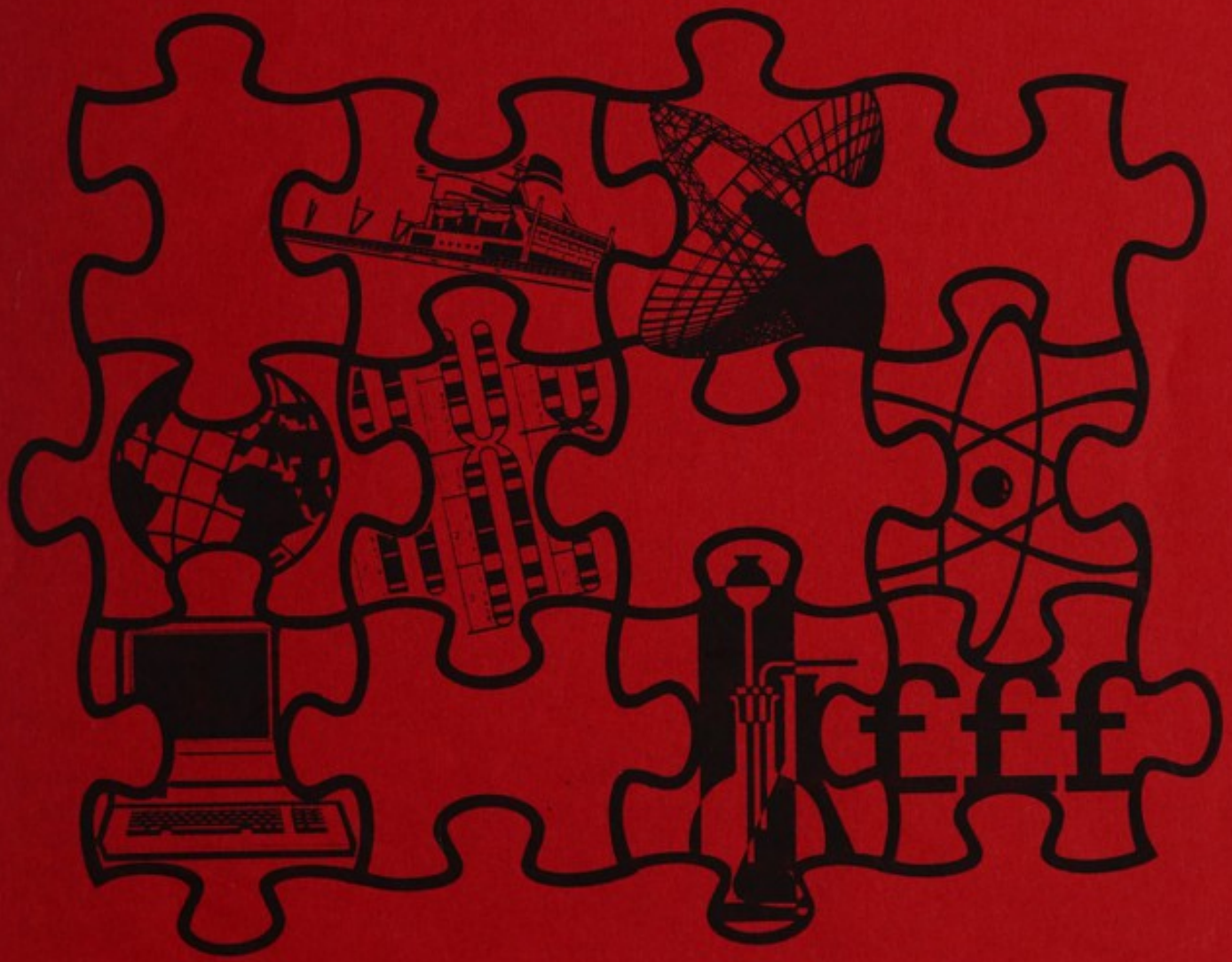
Allocations of the science budget 1990-93 : advice to the Secretary of State for Education and Science from the Advisory Board for the Research Councils.

Allocations of the SCIENCE BUDGET 1990-93



Advice to the
SECRETARY OF STATE FOR EDUCATION & SCIENCE
from the
ADVISORY BOARD FOR THE RESEARCH COUNCILS

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The Rt Hon John MacGregor MP
Secretary of State for Education
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Elizabeth House
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8 December 1989

Dear Secretary of State,

SCIENCE BUDGET ALLOCATIONS 1990-93

The Board greatly welcomed the increases in the Science Budget conveyed in your letter of 16 November. The extra funds which you are providing will sustain the momentum of last year's substantial boost in science funding and allow for some new initiatives in 1990-91.

The enclosed paper sets out our detailed response to your invitation to advise on the allocation of the enhanced Science Budget. The main additions which we are recommending concern:

- the increased costs which the Research Councils and other funded bodies are having to meet on previously planned programmes, because of the higher than expected rate of inflation;
- essential further steps to help secure an adequate supply of the highly qualified scientific manpower which the science base and UK industry will need in the 1990s;
- additional support for important initiatives in global environmental research.

The Board was, inevitably, disappointed that there were insufficient new funds to provide for all the exciting new scientific opportunities to which we drew attention in our advice in May, or to make a substantial start on essential re-equipment. Inflation in the years ahead also continues to be a significant worry. We will be looking carefully at these aspects as part of our 1990 review of Research Councils' forward plans, which we intend should be a fundamental scrutiny of all existing programmes as well as a detailed examination of potential new activities.

The Board and I would be pleased to discuss with you any points arising from the enclosed advice. We trust that, as on previous occasions, you will agree to its publication.

Yours sincerely
David Phillips

DAVID PHILLIPS

ABRC ADVICE ON THE ALLOCATION OF THE SCIENCE BUDGET 1990-93

Introduction

1. The Secretary of State announced on 15 November 1989 that the Science Budget for 1990-91 would be £897 million, with planning figures of £912 million for 1991-92 and £935 million for 1992-93. This represents increases of about £60 million a year on the Government's previous expenditure plans.

2. Subsequently, the Secretary of State wrote to the Chairman of the Board confirming these increases. His letter drew attention to the fact that the expenditure profile is heavily influenced by the addition of £17.2 million in 1990-91 for the construction costs of the RRS James Clark Ross; and that, if provision for this ship is excluded, the settlement implies an increase above the 1989-90 level in "real terms" of 2.5% in 1990-91, and of 3.6% and 3.3% in the two subsequent years.

3. The Secretary of State's letter also set out the Government's views on funding for the remote sensing instruments associated with the ERS-2 satellite and requested the Board's advice on further allocations for earth observation instruments, particularly on Polar Platforms; announced a "final" tranche of earmarked funds for the British Geological Survey; and invited the Board's advice on how the remaining additional resources should best be distributed.

4. This submission presents the Board's response to the Secretary of State's announcement and its advice on the allocation of the new Science Budget totals among the Research Councils and other funded bodies. Firm decisions are required on allocations for 1990-91; provisional indications of likely allocations for subsequent years are also needed by the Councils and other bodies, for planning purposes. The Board's recommendations on these are summarised in Annexes A and B.

Board's Reaction

5. The Board is pleased that last year's substantial increase in the Science Budget has been enhanced and consolidated and welcomes the Secretary of State's remarks about "the importance which the Government attaches to civil science in

the Research Councils and the universities". The settlement means that initiatives started this year can be carried forward with confidence, support for research grants and training awards in higher education institutions can be maintained in real terms, further progress can be made with the strategic reshaping of the science base, and a small number of important new initiatives can be launched.

6. The Board notes that the profile of the Science Budget over the three year period, after "earmarked" items have been excluded, no longer shows a decline if allowance is made for inflation at the level forecast by the Government for the economy generally (the GDP deflator at market prices). This is an improvement over previous plans. But it almost certainly implies some reduction in the volume of science that can be supported by 1992-93. On past experience the cost increases which have to be met by Research Councils will exceed the Government's inflation forecasts by between 1% and 2% a year - partly because of the relatively large proportion of their expenditure which is on salaries. The cumulative effect of this means that it will be prudent for funded bodies to plan for a small but progressive diminution of research activities after 1990. The Board trusts that the Government will reconsider the desirability of this, as part of its review of public spending plans next year. Nevertheless, we are in no doubt that the announced increases in the Science Budget are continued good news for the scientific community and afford scope for some new initiatives in 1990-91 - though they offer the prospect of consolidation rather than major advance in later years.

EARMARKED ADDITIONS

7. The Board's PES Advice in May recognised that decisions on the funding of some programmes paid for out of the Science Budget necessarily take into account broader considerations than those of purely scientific priorities. We acknowledge that additional funding for such programmes is in effect earmarked. The following paragraphs comment on five items which we have thus regarded as a first charge on the increase in the Science Budget.

British Antarctic Survey (BAS)

8. Our Allocations Advice in December 1987 recommended additional funding for NERC to provide a new research and supply vessel for BAS to replace the ageing RRS John Biscoe. This ship - the RRS James Clark Ross - is now under construction, but its costs have increased and a greater part of the expenditure

has slipped into 1990-91. The Government has agreed to meet both these extra burdens on NERC with additional allocations of £17.2 million in 1990-91 and £1.4 million in 1991-92.

British Geological Survey (BGS)

9. Following the Government's decisions last year that the BGS should remain as a part of the NERC and that it should have a core programme of surveying, additional allocations were made for BGS pending a detailed definition of that programme and a review of the Survey's funding arrangements and charging policies. In the light of that further work the Government has decided to supplement provision for the National Geosciences Information Service by £1 million in 1990-91, £2 million in 1991-92, and £3 million in 1992-93. Additionally, there has been a transfer of £0.8 million a year from DTI to the Science Budget to underpin the inclusion of the Geochemical Survey as part of the BGS's core programme.

Earth Observation

10. In October, the Government committed the UK to contributing to the cost of the European Space Agency's next earth observation satellite: ERS-2. Most of the costs will fall to the DTI, but the Science Budget will have to contribute to instrumentation costs. SERC will be building an Advanced Along-Track Scanning Radiometer at its Rutherford Appleton Laboratory and £2 million is needed for this in each of the next three years.

Tuition Fees

11. The Government's decisions to effect a substantial increase in tuition fees for undergraduate students from 1990-91 will, for the most part, not affect the Research Councils. Fees for postgraduate students will not be increased and they constitute virtually all of the students supported by the Councils. However, the MRC supports about 150 students who undertake a one-year intercalated BSc course within their undergraduate medical training. A transfer has been agreed from the UFC to cover the increased cost of their fees, amounting to £0.1m in 1990-91 and £0.2m in later years.

DEVELOPMENT OF UK SCIENCE

12. The Board's PES Advice last May highlighted the major changes occurring in science in the UK and, more especially, world-wide. We stressed the importance of basic and strategic science for the UK's social and economic well-being and drew attention to evidence that expenditure on academic research in the UK is significantly less as a proportion of GDP than in other major European countries. We saw a particular need to sustain the UK's leading role in global environmental research. We also argued, however, that progress in developing new initiatives would be blighted unless urgent attention was given to the underlying health of the science base, through the protection of curiosity-motivated research, increased investment in manpower and equipment, and essential Research Council restructuring. These remain our primary concerns.

13. We welcome the important statement of Government policy for civil science, made by the former Secretary of State in his speech to the Academia Europaea on 26 June. This recognised that "Government spending on basic and strategic research underpins a whole range of the nation's needs - economic, environmental, social and cultural." But it also acknowledged the need for selectivity in the choice of priorities and concentration in the distribution of resources. These considerations have guided the recommendations which are set out in the following paragraphs.

PRESERVING THE QUALITY OF UK SCIENCE

14. In our PES Advice we estimated that the planning figures for the Science Budget implied a real terms reduction below the 1989-90 level of at least £20 million in 1990-91 and £30 million in each of the two subsequent years. Latest estimates suggest that the forward plans of Councils and other funded bodies are being more severely eroded by inflation than previously forecast. Almost certainly pay costs will rise by more than 7% and non-pay costs by more than 6% in 1990-91. Even after making every effort to achieve efficiency savings and to safeguard their top priorities, some of the most important activities of the Councils, and of the Royal Society and Fellowship of Engineering, will be jeopardized unless the real value of their baseline budgets can be sustained at 1989-90 levels.

15. The Board is particularly concerned that support for curiosity-motivated research in higher education institutions, including provision of the specialized equipment so essential for front-rank research, might be most at risk - because this aspect of Councils' expenditures includes a proportionately larger element which is as yet uncommitted. Other programmes and activities would also be threatened if present planning allocations were not increased.

16. We therefore recommend that roughly half of the additional monies now available should be allocated to funded bodies to help preserve the quality and scope of their current programmes. Such allocations should avert the need for reductions in the overall volume of activities in 1990-91 - though there will be some reductions in particular programmes, offset by increases in others - and should limit the programme reductions in later years for which funded bodies will need to plan. The following paragraphs illustrate the sorts of programmes which would thereby be safeguarded in 1990-91 but which will remain at risk, at least partly, in subsequent years.

17. AFRC is presently faced with losses of up to 500 staff from its Institutes over the next 3 years, due to cuts in MAFF commissions. It should now be possible to avoid greater redundancies and the erosion of support for science in the Institutes and in universities in 1990-91. But for later years some economies will have to be found in areas of lowest priority; these might include elements of the Council's research on biochemical and physiological aspects of grassland research, reproductive and lactational physiology, composition and properties of food materials, and plant and animal production engineering.

18. The main risk for the ESRC has been the possible need to cut the proportion of alpha-rated research projects it could fund to only 50% by number and 33% by value. This prospect is now deferred until 1991. Other programmes which might also be at risk then include: the Management Teaching Fellowship Scheme, designed to underpin the Management Charter Initiative; the Cognitive Science joint programme with SERC and MRC; ageing research; and important new databases for environmental and linguistics research.

19. MRC was unable to fund some £2 million-worth of alpha-rated major programmes and special projects in 1988-89 on subjects such as mortality differentials and their impact, colorectal cancer, blood transfusion, respiratory infection, rubella, and genetic and environmental factors in asthma. In addition,

some 300 smaller alpha-rated research project grants were not funded. It should now be possible to avoid a deterioration of this situation in 1990-91. But the Council will have to plan on the basis of some worsening subsequently; for capital equipment and building needs at its Units to remain unmet; and, perhaps, for intended increases in studentship and fellowship numbers to be deferred.

20. There will be a continued future risk to NERC's plans to increase the proportion of its budget going to university support and to make good some of the serious inadequacies in equipment provision which were highlighted in the ABRC's recent study. In order to fund these high priority activities after 1990-91, the Council will have to plan for only limited development of present research programmes - with the possibility of having to make further cuts in manpower and capital projects at its Institutes.

21. On previous plans SERC, which is the major provider of trained postgraduate manpower for the Science Base as a whole, would have had to decrease studentships in 1990 by 800; reduce its commitment on responsive and initiatory grants in science and engineering by £30 million; and cut expenditure on facilities such as ISIS which are important for international as well as UK science. These prospective difficulties have been aggravated by the recent fall in the value of sterling which will require SERC to find an additional £3.5 million for international subscriptions. Whilst such reductions should now be avoidable in 1990-91, planning for more limited reductions in later years will need to be continued.

22. The Royal Society had risked losing up to 15 University Research Fellowship posts from October 1990, resulting in fewer opportunities for the most talented young scientists to embark on academic research careers. That prospect has now receded for a year. Similarly, the possibility of reductions in the Society's various other grants and fellowships schemes and programmes should not now arise until 1991-92.

23. To help ensure that the quality of UK science remains high by international standards, and to sustain the sorts of programmes illustrated in the preceding paragraphs, the Board recommends allocations totalling £22 million in 1990-91, £24 million in 1991-92 and £30 million in 1992-93. We propose that these sums be distributed between AFRC, ESRC, MRC, SERC and the Royal Society in relation to the cost increases they face immediately and relative to their baseline planning allocations for later years. NERC and the Fellowship of Engineering plan such

that costs increases are a first charge against the sums freed by the natural turnover of research programmes; their needs for funds for new initiatives are correspondingly greater and the Board kept this in mind in considering its other allocation recommendations below.

24. Additionally, the Board strongly urges that the Department should review again the various arrangements which determine the sterling cost of international subscriptions. It is clear to us that SERC's current problems on this front derive largely from present Treasury requirements on the timing of foreign exchange transactions.

NEW SCIENTIFIC OPPORTUNITIES

25. Science is moving rapidly in new and exciting directions. As it develops, major new problems for investigation are revealed and more advanced techniques and facilities are devised, enhancing potential for new discoveries. This has been particularly marked in the biological sciences, which have become increasingly pervasive. At the same time, scientific discoveries have increased public awareness of problems and public demand for scientific solutions: this has been most obvious in the environmental sciences, where global concerns have stimulated international scientific cooperation. Although Britain's industrially funded R&D still lags behind that of other industrialised nations, UK industry is increasingly recognising the importance of basic and strategic research and is now collaborating more closely with the Research Councils and universities - in part through schemes such as LINK which have been developed for this express purpose. The Government's policy on near-market research is also changing the nature and balance of the Research Councils' activities, giving greater salience to their vital role in supporting basic research. The short-term effects, especially the manpower implications of this, are sometimes painful but the long-run opportunities are immense.

26. We have consistently argued that the UK cannot expect to provide the expertise or resources to contribute significantly towards, let along lead, every field of science. Selectivity and concentration, giving priority to fields in which UK scientists are well placed to make important contributions, is vital. But we have also stressed the importance of balancing support for initiatives and specially promoted programmes with adequate funding for research in the responsive mode. These considerations have once again guided out thinking about the allocation of the Science Budget.

Research Programmes and Centres

27. Our PES Advice earlier this year recommended funding for a variety of important new opportunities for environmental and climatic research. Within the funds now made available by Government, it is not possible to give priority to all of these, but we recommend that a substantial proportion of the available funds should be devoted to those NERC programmes which are most timely and promising. The importance of understanding the role of the oceans in global warming and of improving predictions of climatic changes necessitates full UK participation in the important World Ocean Circulation Experiment (WOCE) which will gather data vital for global climate change modelling, over the next seven years. Together with other important global environmental research, this will require additional allocations to NERC of £1.9 million in 1990-91, £3.4 million in 1991-92 and £3.5 million in 1992-93. Environmental research will also benefit substantially from the allocations we recommend (see paragraphs 37 and 38 below) for rebuilding of the RRS Discovery and for earth observation instruments.

28. AFRC has undergone a major transformation both in its structure and in the balance of its research activities. But the high frictional costs associated with the restructuring of its Institutes impede its ability to embark on major new programmes of basic research. The most pressing priority is additional funding for the newly developed programme of slow virus research, designed in particular to improve basic understanding at the molecular and cellular levels of the BSE agent and its host interactions. We recommended allocations of £0.8 million rising to £3.5 million for this.

29. The Flemming Review of the Interdisciplinary Research Centre (IRC) initiative concluded that IRCs should henceforth be regarded as one of a range of mechanisms for promoting interdisciplinary research and inter-departmental co-operation. It should be for Councils to decide whether the IRC mode is appropriate for meeting needs for new research and, if so, to make a case for additional funds if necessary. Now that 17 IRCs have been approved for funding and some major interdisciplinary research programmes initiated as a spin-off from the IRC initiative, the Board does not intend to set targets for the number of new IRCs to be launched each year. This year, we recommend allocations to ESRC, MRC and SERC to enable them to sustain the IRCs started in 1988 with partial funding from the then UGC (£0.8m; £1.6m; £1.9m); and to ESRC for a new IRC on Labour Markets, based on the well-established Centre for Labour Economics at the LSE, but incorporating additional expertise in industrial and occupational psychology and sociology (£0.4m in 1990-91 rising to £0.6m).

30. The Board was also attracted by a number of other high quality and exciting proposals for major new programmes of research in important and developing areas of science. These included: plans by MRC and SERC for new IRCs in fields such as neurodegenerative diseases, brain and behaviour, safety critical systems and biochemical engineering; AFRC's proposals for new work in stem cell biology; further enhancement of the research NERC is funding on climate change; and SERC's plans for increased research on atmospheric chemistry. Regrettably, however, the funds available will not permit the launch of major initiatives in these fields - though we hope and believe that the Councils may be able to support more limited effort in some of them.

Research Grants and Manpower Training

31. The sums we have recommended for preserving the quality of UK science will help the responsive research grant schemes of the Councils and to reduce the number of alpha-rated grants which cannot be funded. But we also recommend small additions to the budgets of ESRC, NERC and SERC to help them maintain research grant success rates in the face of increased high quality demand, and thereby to provide adequate support for talented individuals pursuing curiosity-motivated research. The total sums required for this are £1.7m in 1990-91, with planning allocations of £5.2m and £7.4m in subsequent years.

32. Maintenance of the quality of research in higher education institutions and the Councils' own establishments demands that more attention is given to maintaining an adequate flow of able graduates into postgraduate study and ensuring high standards of training and supervision. Much is being done by the Research Councils to improve databases and information about demand for postgraduate awards, trends in take-up of studentships and first employment of postgraduates. But more still needs to be done to improve knowledge about needs for postgraduate trained manpower and the factors which determine graduates' career choices. The present evidence is that the growing demand for graduates in industry and commerce and the attractions of employment there, coupled with the limited opportunities and rewards for permanent academic research careers, make it increasingly difficult for the universities and Research Councils to attract high quality applicants for studentships and research assistantships.

33. Against that background, the Board continue to give very high priority to support for initiatives to improve manpower training and supply. The Research Councils and other funded bodies are tackling problems in this area in a variety of ways which, taken together, should have a significant impact; and which, we recommend, should be encouraged with additional funding. First, they have increased the value of their postgraduate maintenance grants in 1989-90 and have abolished the rules which penalised postgraduates on account of spouses' or other income: this has restored the real value of postgraduate awards to late-1970s levels. Second, AFRC and MRC have begun to increase the number of postgraduate awards they offer, in order to train more scientists in key areas of the biological sciences, while ESRC is giving priority to research methods training and to meeting needs for new skills in areas such as geographical information systems. Third, the Councils (including, from 1990, the MRC) have tried to enhance the support offered to postgraduate students and to meet industrial needs for very highly qualified manpower through collaborative award schemes, although demand for these schemes from students has been uneven. The SERC's Integrated Graduate Development Scheme (IGDS) has been a pioneering attempt to improve scientific skills and understanding in industry, through part-time training up to Masters level. Fourth, the Royal Society is expanding its University Research Fellowship Scheme which provides long-term funding (5 years, renewable for a further 5 years) for the most talented postdoctoral researchers - who will renew the cadre of university staff during the 1990s. Some of the Research Councils and the Fellowship of Engineering have also increased their support for postdoctoral scientists and plan further increases, including through the creation of new fellowship awards. Fifth, the Royal Society and Fellowship of Engineering are providing greater opportunities for UK scientists to learn from and collaborate with overseas counterparts through exchange schemes, overseas fellowships and travel grants.

34. The overall number of new postgraduate awards taken up by November 1989 was somewhat higher than in 1988, which suggests that the increase in maintenance grants may have had a beneficial effect. But difficulties were experienced in attracting suitably qualified candidates in some fields - particularly microbiology, biochemistry and molecular biology - where industry and the universities are in competition for the best graduates. Much remains to be done to improve the attractions of postgraduate study and to offer exciting career prospects for the most talented if a manpower crisis in the 1990s is to be avoided. We recommend additional expenditure of £11.4 million in 1990-91, and £14.4 million and £16.4 million in the two subsequent years, to sustain and strengthen the initiatives described above.

Selective Re-equipment

35. We argued in our PES Advice that selective injections of funds were needed to make good equipment deficiencies which are hampering the development of research. But we emphasised that this should be phased, in order to establish a rolling programme of replacement; and carefully targetted to meet the most urgent needs, with arrangements to ensure optimal use through sharing where appropriate. The Board was disappointed that it was not possible on this occasion to recommend a substantial start on necessary reequipment. However, we are suggesting that the Research Councils should deploy some of the additional funds we have recommended for preserving the quality of science specifically to increase equipment provision through research grants. Funding for new research programmes and IRCs will also include some provision for equipment. We further recommend the allocation of additional sums for NERC to meet special equipment needs of its grant-holders in higher education institutions, and for SERC to enhance the joint Research Councils' CRAY supercomputer.

36. The Board noted that the UFC has been allocated some £10 million a year extra to support universities' spending on research equipment. This too will help alleviate some present deficiencies and, as we have noted previously, continuing productive dialogue on equipment (and other research) matters between the Research Councils and the UFC will be essential.

37. We recommended earlier that NERC be allocated additional funds to ensure full UK participation in WOCE. To be wholly effective this also demands rebuilding of the 27-year-old RRS Discovery - both to ensure its continued sea-worthiness and to modernise and improve its capacity for ocean-going scientific observations and experimentation. About 60% of the sea-time of the refurbished ship would be devoted to WOCE until the late 1990s, with the remainder being available to support other NERC research in marine biology and geophysics. The cost will be £6m in each of 1990-91 and 1991-92.

38. The funding which has been earmarked for remote sensing instruments for the ERS-2 satellite will help UK scientists to continue to play a full role in international climate research programmes, using continuing data series, throughout most of the 1990s. Towards the end of the decade, however, the main earth observation role will be taken over by the Polar Platform satellites being planned by ESA and NASA. The SERC is developing advanced instruments which might fly on these Platforms, and we recommend allocations of £0.8 million in 1990-91, £2.0 million in 1991-92 and £4.0 million in 1992-93 to support this work.

Research Council Restructuring

39. AFRC has made impressive progress in consolidating its Institutes onto one or two sites each, so that first-rate research may be conducted more cost-effectively and in closer collaboration with universities. The need to implement the last two elements in this restructuring programme has been made more urgent by the impact of reductions in MAFF support for near-market research. The longer the delay, the higher will be the cost of staff losses and the greater the opportunity costs in terms of lost science. Investment now will enable AFRC to press ahead faster with the development and realignment of its basic research in molecular and cell biology. But additional funds are needed if the expansion of the Council's support for university research and the continuing work of the Institutes are not to be unduly restricted. Taking account of AFRC's expected income from asset sales (arising from earlier restructuring exercises), we therefore recommend allocations of £5 million in 1990-91 and £7 million in 1991-92 to implement the Council's plans for the Institute of Food Research and the Institute for Grassland and Animal Production.

40. We await with interest the outcome of current discussions between MAFF, the DES and AFRC about the future configuration of the Institute of Horticultural Research. Once this is decided, AFRC's major restructuring programmes will be finalised.

41. We also recommend the allocation of £4.1 million in 1990-91 to cover the net balance of costs to AFRC and ESRC of relocating their headquarters to Swindon, and the cost both to them and to SERC and NERC of the extension to Polaris House. However, £0.7 million of this can be recouped in 1991-92 from earlier allocations for this purpose, and thereafter savings in rent and efficiency savings through joint working will release more funds for science.

Other

42. Finally, we recommend small allocations for the Royal Society's Public Understanding of Science programme and the Academia Europaea, amounting to £0.1m a year.

FLEXIBILITY MARGIN

43. The Board sees a continuing need for a Flexibility Margin of sufficient size to cater for contingencies, encourage forward planning and help stimulate important new developments - especially those which demand co-operation between Research Councils. Our experience this year has reinforced the need for this. We therefore recommend retention of a Flexibility Margin equivalent to 2% of the total Science Budget in 1991-92 and 4% in 1992-93.

CONCLUSIONS

44. The Board welcomes the increase in the Science Budget for 1990-91, which will enable the momentum established last year to be maintained and the strength and quality of the Science Base to be protected. We are encouraged by the fact that, despite difficult economic circumstances, the Government regards expenditure on civil science as a worthwhile investment for the benefit of the UK. We believe that the scientific community will share these views.

45. Nevertheless, the sums available - once "earmarked" items and large but essential capital costs have been deducted - have enabled us to recommend only a small part of what we consider to be necessary to meet equipment needs in the universities and to carry forward some of the major new programmes of scientific research which we believe to be both timely and important. In making our choices, we have been careful to strike a balance between the structural needs of the science base; support for strategic research offering a clear prospect of environmental, economic or social benefit; and provision for our most creative scientists to pursue their new ideas and priorities. A full list of our recommended additional allocations is in Annex A, and the resulting total plans for each funded body are summarised in Annex B.

ANNEX A

SCIENCE BUDGET: RECOMMENDED ADDITIONS TO PREVIOUS PLANNING ALLOCATIONS

£ million

	1990-91	1991-92	1992-93
1. "Earmarked" Additions			
British Antarctic Survey (NERC)	17.2	1.4	-
British Geological Survey (NERC)	1.0	2.0	3.0
ERS-2 Instruments (SERC)	2.0	2.0	2.0
Transfer from DTI for BGS costs (NERC)	0.8	0.8	0.8
Transfer from UFC for Intercalated Awards fees (MRC)	0.1	0.2	0.2
Sub-Total	21.1	6.4	6.0
2. Preserving Quality of UK Science			
AFRC	2.0	2.6	3.3
ESRC	0.6	1.0	1.3
MRC	3.2	5.9	7.7
SERC	15.1	13.1	17.1
Royal Society	0.85	0.90	0.95
Sub-Total	21.75	23.50	30.35
3. Research Programmes and Centres			
Slow Viruses (AFRC)	0.8	2.0	3.5
Labour Markets IRC (ESRC)	0.4	0.5	0.6
Environment incl. WOCE (NERC)	1.9	3.4	3.5
IRC costs (ESRC, MRC, SERC)	0.8	1.6	1.9
Sub-Total	3.9	7.5	9.5
4. Research Grants: Responsive Mode			
ESRC	0.2	0.7	0.6
NERC	0.5	1.5	2.8
SERC	1.0	3.0	4.0
Sub-Total	1.7	5.2	7.4
5. Manpower and Training			
£600 increase in studentships (all Councils)	7.9	7.9	7.9
University Training and Manpower (AFRC)	0.7	0.9	1.4
Studentships (ESRC)	0.2	0.5	0.6
Collaborative Studentships (MRC)	0.6	1.0	1.6
Studentships + Fellowships (NERC)	0.7	1.2	1.7
Integrated Graduate Development Scheme (SERC)	0.5	1.0	1.2
USSR Exchanges (Royal Society)	0.12	0.16	0.19
University Research Fellowships (Royal Society)	0.42	1.13	1.46

	£ million 1990-91	1991-92	1992-93
Endeavour Fellowships (Royal Society)	0.15	0.33	-
Various Schemes (Fellowship of Engineering)	0.15	0.25	0.30
Sub-Total	11.44	14.37	16.35
6. Selective Re-equipment			
RRS Discovery rebuilding (NERC)	6.0	6.0	-
Equipment for HE Support (NERC)	0.6	1.0	1.0
Polar Platform instruments (SERC)	0.8	2.0	4.0
CRAY enhancement (SERC, on behalf of all Councils)	-	1.7	0.1
Sub-Total	7.4	10.7	5.1
7. Research Council Restructuring			
Polaris House Extension (AFRC, ESRC, NERC, SERC)	4.1	-0.7	-
Institute of Food Research (AFRC)	4.0	2.0	-
Institute for Grassland and Animal Production (AFRC)	1.0	5.0	-
Sub-Total	9.1	6.3	-
8. Other			
Public Understanding of Science (Royal Society)	0.09	0.09	-
Academia Europaea (Royal Society)	0.02	0.02	0.02
Sub-Total	0.11	0.11	0.02
TOTAL ADDITIONS[1]	76.5	74.1	74.7

[1] Includes distribution of the Board's 1990-91 Flexibility Margin

ANNEX B

SCIENCE BUDGET: RECOMMENDED ALLOCATIONS FOR 1990-91 AND PLANNING FIGURES FOR 1991-92 AND 1992-93

	£ million		
	1990-91	1991-92	1992-93
AFRC	86.6	91.8	88.4
ESRC	36.2	35.2	35.8
MRC	185.7	192.0	195.2
NERC	136.0	121.3	117.1
SERC	437.1	437.4	444.2
Royal Society	13.94	15.35	15.37
Fellowship of Engineering	1.19	1.36	1.41
ABRC (Secretariat, Science Policy Studies and CEST)	0.31	0.34	0.38
Flexibility Margin	-	17.4	36.7
TOTAL	897.1	912.3	934.6

ABRC: TERMS OF REFERENCE AND MEMBERSHIP

THE ADVISORY BOARD FOR THE RESEARCH COUNCILS was established by the Secretary of State for Education and Science in 1972 with the following terms of reference:-

a. To advise the Secretary of State on his responsibilities for civil science with particular reference to the Research Council system, its articulation with the universities and departments, the support of postgraduate students and the proper balance between international and national scientific activity;

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

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

MEMBERSHIP

Professor Sir David Phillips, KBE, FRS (Chairman)	-	Professor of Molecular Biophysics, University of Oxford.
Professor E Ash, CBE, FRS, FEng	-	Rector, Imperial College, University of London.
Professor R L Bell, CB	-	Director-General of ADAS, Ministry of Agriculture Fisheries and Food.
Professor Margaret Boden, FBA	-	Professor of Philosophy and Psychology, University of Sussex.
Dr R F Coleman	-	Chief Engineer and Scientist, Department of Trade and Industry.
Sir Roger Elliott, FRS	-	Secretary to the Delegates and Chief Executive, Oxford University Press.
Mr J Fairclough, FEng	-	Chief Scientific Adviser, Cabinet Office.
Dr D J Fisk	-	Chief Scientist, Department of the Environment.
Mr J S Flemming	-	Executive Director, Bank of England.

Professor J L Knill	-	Chairman, Natural Environment Research Council.
Professor June Lloyd, FRCP	-	Professor, Institute of Child Health, University of London.
Professor E W J Mitchell, CBE, FRS	-	Chairman, Science and Engineering Research Council.
Mr J R S Morris, CBE, FEng (Deputy Chairman)	-	Chairman, Brown and Root (UK) Ltd.
Professor H Newby	-	Chairman, Economic and Social Research Council.
Professor Sir Richard Norman, FRS	-	Scientific Adviser, Department of Energy.
Professor E R Oxburgh, FRS	-	Chief Scientific Adviser, Ministry of Defence.
Professor F W O'Grady, CBE	-	Chief Scientist, Department of Health.
Sir Charles Reece	-	formerly Research and Technology Director, ICI.
Dr D A Rees, FRS	-	Secretary, Medical Research Council.
Dr N J Shackleton, FRS	-	Director of Quaternary Research, University of Cambridge.
Sir David Smith, FRS	-	Principal and Vice-Chancellor, University of Edinburgh.
Professor W D P Stewart, DSc, FRSE, FRS	-	Secretary, Agricultural and Food Research Council.
Sir Peter Swinnerton-Dyer, KBE, FRS	-	Chief Executive, Universities Funding Council.
Sir Francis Tombs, FEng	-	Chairman, Rolls-Royce Ltd; Chairman, ACOST.
Mr J M M Vereker	-	DES Assessor.
Mr D A Wilkinson	-	DES Assessor.

SECRETARY

Mr P J Thorpe

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Chairman
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Elizabeth House
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London
SE1 7PH

Dear David,

SCIENCE BUDGET ALLOCATIONS 1990/91 TO 1992/93

Thank you for your letter of 8 December enclosing the Board's advice on the allocation of the Science Budget.

I am pleased to accept the Board's advice in respect both of allocations for 1990/91 and of planning figures for the following two years.

I note that in its next review of Research Councils' forward plans the Board intends to undertake a fundamental scrutiny of all existing programmes as well as a detailed examination of potential new activities. I look forward to receiving your advice in due course.

I am grateful for the help which you and the members of the Board have given to me in considering the allocation of the Science Budget, and I was pleased to note that you think that the extra funds which the Government is making available will sustain the momentum of last year's substantial boost in science funding and provide scope for some new initiatives.

I confirm that I shall be publishing the Board's advice in the usual way.

Yours ever

Kenneth