

Allocations of the science budget 1989-92 : advice to the Secretary of State for Education & Science from the Advisory Board for the Research Councils.

Contributors

Great Britain. Advisory Board for the Research Councils.

Great Britain. Department of Education and Science.

Publication/Creation

[London] : [The Board?], 1988.

Persistent URL

<https://wellcomecollection.org/works/x7szsnv6>

License and attribution

You have permission to make copies of this work under an Open Government license.

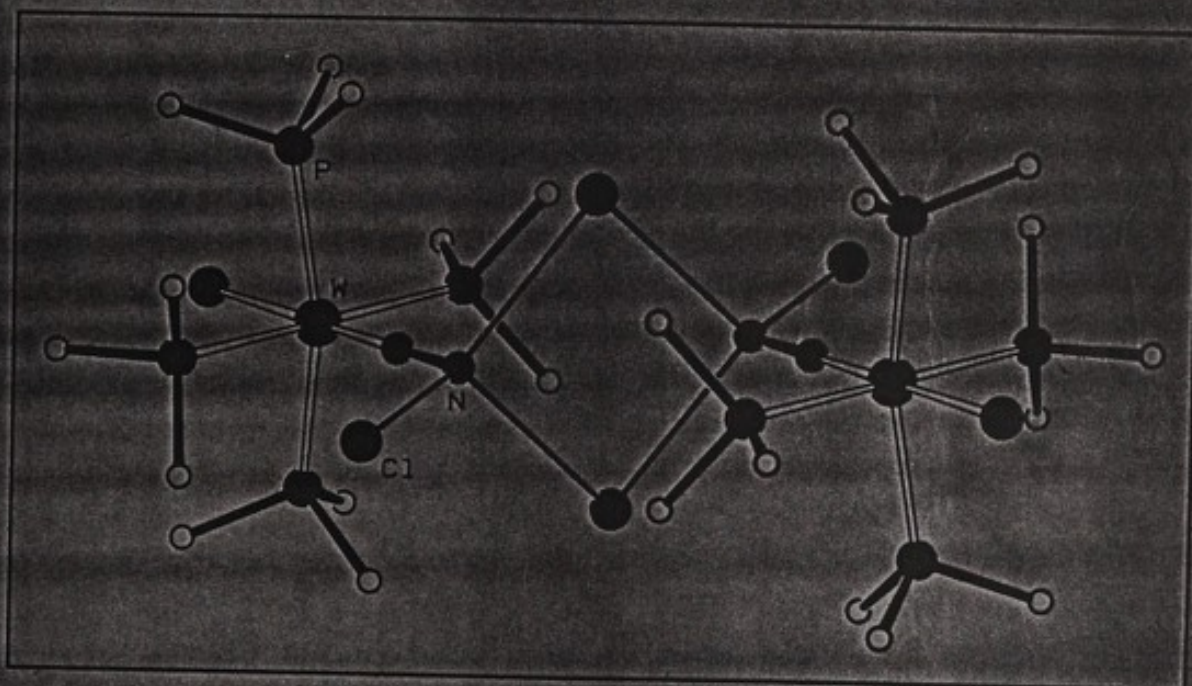
This licence permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Image source should be attributed as specified in the full catalogue record. If no source is given the image should be attributed to Wellcome Collection.

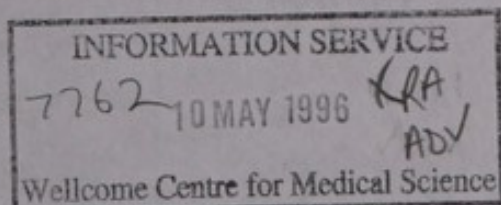


Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

Allocations of the SCIENCE BUDGET 1989 – 92



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



WELLCOME
LIBRARY

P

7990



22501855702



Chairman
Sir David Phillips FRS

Secretary
P J Thorpe

Advisory Board for the Research Councils

Elizabeth House York Road London SE1 7PH

Direct line 01-934 9849
GTN Number 2914 9849
Fax 01-934 9389

ELIZABETH HOUSE
YORK ROAD
LONDON SE1 7PH
01-934 9849

Rt Hon Kenneth Baker MP
Secretary of State for Education and Science
Elizabeth House
York Road
LONDON SE1 7PH

13 December 1988

2 February 1989

Dear Secretary of State,

SCIENCE BUDGET ALLOCATIONS 1989-92

Your letter of 11 November was warmly welcomed by the Board. We were delighted by the substantial increases in the Government's plans for the Science Budget, and greatly encouraged by what you had to say about the importance to the nation of maintaining excellence in basic and strategic science.

The enclosed paper responds to your invitation to advise on the allocation of the enhanced Science Budget. The Board is recommending additional funding to sustain top-quality science across a broad field of endeavour and to achieve an appropriate balance between basic and strategic, directed and curiosity-motivated research programmes. But at the same time we have deliberately focussed on a selection of important new scientific opportunities, and have sought means which will foster purposeful reshaping of the science base - the better to provide for the excellence of UK science into the twenty-first century.

Inevitably there are various uncertainties, and in a number of areas our recommendations are less firm for the years after 1989-90. In particular, aspects of scientific manpower, research equipment and the MRC's clinical research initiative will require further detailed attention as part of our next annual scrutiny of the needs of the science base and the implications of the Government's spending plans. Together with the final stages of the Board's review of Research Councils' responsibilities in the biological sciences and our promised stock-taking of progress on the IRC initiative, these will provide a substantial agenda for the Board in 1989. This year's PES settlement provides an excellent foundation for the development of UK science. We look forward to the opportunity of offering you further advice on future progress.

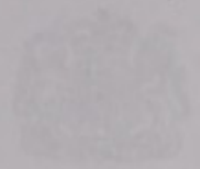
The Board and I would be pleased to discuss with you any points arising from the enclosed advice. We trust that, as on previous occasions, you will agree to its publication.

Yours sincerely,

David Phillips.

DAVID PHILLIPS

Chairman
The Honourable
Mr. J. G. D. [Name]



Secretary
The Honourable
Mr. [Name]

110
111

Mr. [Name]
Secretary of State for Education and Science
110
111

11 December 1954

Dear Sir,

SCIENCE BUDGET ALLOCATIONS 1954-55

Your letter of 1 November was warmly welcomed by the Board. The Board is delighted by the substantial increase in the Government's plans for the 1954-55 Budget, and greatly encouraged by what you had to say about the importance of the nation of maintaining excellence in basic and strategic research.

The enclosed paper responds to your invitation to advise on the allocation of the Science Budget. The Board is recommending additional funds to be allocated to top-quality science across a broad field of endeavour and to research in appropriate balance between basic and strategic, directed and non-directed, research programmes. But at the same time we have deliberately focused on a selection of important new scientific opportunities, and have sought to ensure that will foster purposeful reshaping of the science base - the better response for the excellence of UK science into the twenty-first century.

Inevitably there are various uncertainties, and in a number of areas our resources are less than for the years after 1957-58. In particular, the of scientific equipment, research equipment and the MRC's clinical research initiative will require further detailed attention as part of our annual review of the needs of the science base and the implications of the Government's spending plan. Together with the final stage of the Board's review of Research Councils' responsibilities in the biological sciences and our proposed new funding programme on the MRC initiative, these will provide a substantial response for the Board in 1955. This year's 1954-55 Budget provides an excellent opportunity for the development of UK science. We look forward to the opportunity of a further response on future progress.

The Board and I would be pleased to discuss with you any matter arising from the above. We look forward to your response.

Yours faithfully,
[Signature]
[Name]
[Title]



ELIZABETH HOUSE
YORK ROAD
LONDON SE1 7PH
01-934 9000

Sir David Phillips KBE FRS
Chairman
Advisory Board for the Research
Councils
Elizabeth House
LONDON
SE1 7PH

2 February 1989

SCIENCE BUDGET ALLOCATIONS 1989-90 TO 1991-92

1. Thank you for your letter of 13 December enclosing the Board's advice on the allocation of the Science Budget.
2. I am pleased to accept the Board's advice in respect both of allocations for 1989-90 and of planning figures for the following two years, subject to the points set out below.
3. Your letter refers to a number of areas in which there are uncertainties and in respect of which the Board's recommendations are less firm for the years after 1989-90. I look forward to receiving further advice on these matters in due course.
4. Interdisciplinary Research Centres have clearly caught the imagination of the scientific community. My acceptance of the Board's advice will result in 9 new Centres, with a substantial increase in expenditure on reshaping the science base and increasing scientific collaboration between institutions and between disciplines. This will bring the total number of IRCs up to 17. It is clearly desirable to take stock before proceeding further with this new mode of research funding. I therefore welcome the Board's intention to review this initiative and to assess experience to date in the selection, support, monitoring and management of existing Centres. I look forward to learning your conclusions later this year. I should also like the Board to oversee the establishment of the new batch of IRCs to ensure that the lessons which have been learnt so far are fully applied and that the Centres meet the highest possible standards of organisation and management. I should be grateful if the Department could be kept closely in touch with the Board's work on these matters, through my Assessors.

5. In conclusion, may I thank you and your colleagues for the work which you have done to assist me in the allocation of the very substantial new resources which the Government has made available for science - resources which, as you say, will sustain top quality science, exploit new scientific opportunities, and provide for the excellence of UK science into the 21st century.

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

Handwritten signature

Handwritten signature

British Antarctic Survey (BAS)

8. The Government wishes to support in full NERC's proposals for additional expenditure by BAS. These will provide for: the Survey's outstanding scientific programme to be sustained; the rebuilding of the Halley base which is badly affected by compacted ice; and better access through construction of a gravel airstrip at Rothera and purchase of a larger aircraft. The cost will be £9.7m in 1989-90, £8.5m in 1990-91 and £4.8m in 1991-92. Additionally, we understand that NERC faces higher than expected costs for the replacement of the RRS John Biscoe, and will advise further on this next year.

CERN

9. The Board has previously advised that the Government should seek to reduce the level of the UK's subscription to CERN and that it should provide additional resources to cover the amount by which the subscription exceeded what could be justified in relation to UK scientific priorities, or that the UK should cease to be a member. We understand that encouraging progress has been made in negotiations with other member countries aimed at following through the recommendations of the Abragam Review of CERN's management and introducing a new system for assessing members' subscriptions. If, as a result, the UK Government decides to remain in membership of CERN, it is estimated that an additional allocation to SERC of £9.3m in 1989-90 and £7.3m in later years will be needed.

AIDS

10. The Secretary of State decided last year that funding for the continuation of the MRC's Directed Programme of research on AIDS in 1990-91 and later years should be considered in the light of the agreed evaluation of the programme, and that it would be provided as an addition to the then current plans for the Science Budget. Following the successful outcome of the review, an additional £8m in 1990-91 and £8.5m in 1991-92 is to be allocated. The Board is also recommending an enhancement of MRC's strategic programme of AIDS research (see para 32 below).

Near-Market Agricultural Research

11. The Board supports the Government's policy of withdrawing from the funding of near-market research and of redeploying the funds released to the support of basic and strategic research. However, the announced reductions in MAFF's spending on near-market agricultural research seem likely to give rise to a significant reduction in AFRC's portfolio of commissioned research with a resulting requirement for staff reductions and redundancies. The extent and timing of these will depend on decisions yet to be taken by MAFF - including on the deployment of the Ministry's increased spending on strategic research - and on the extent of any offsetting increase in industrial funding. The Government has indicated that £3m in 1989-90, £4m in 1990-91 and £6m in 1991-92 should be set aside to cover the associated costs to AFRC, with this provision being reviewed in the light of actual needs.

VAT on Construction Costs

12. Following the extension of VAT to the construction costs of new buildings, announced by the Government in June, the Research Councils need additional allocations totalling £4.3m over 1989-92 to maintain the value of their existing capital programmes.

DEVELOPMENT OF UK SCIENCE

13. The Board's PES Advice in May was geared to enabling the science base to grasp a selection of the scientific opportunities now apparent, and to creating the right environment to attract and nurture scientific talent. We recognised that the UK cannot afford to pursue all the opportunities that beckon. But we were, and are, certain that the nation's future economic and social development depends in large part on providing the means to advance the frontiers of knowledge across a broad range of science, focussing on areas chosen with an eye to both quality and potential exploitability.

14. Allied to this we argued - as we had in our Strategy Advice last year - that there is a need to make faster progress with reshaping of the science base. Much of the necessary refocussing can be achieved in conjunction with the pursuit of selected scientific opportunities; and our proposals for interdisciplinary research centres and further restructuring of Research Council institutes were designed with

this double pay-off in mind. Inevitably there will be some transitional costs: the Board judged these to be an essential investment in the future effectiveness of the science base.

15. We greatly welcome the Secretary of State's commitment, in his letter of 11 November, to these broad objectives. They remain at the heart of our approach in advising on the allocation of the roughly £73m a year unhypothecated addition to the Science Budget. The following paragraphs set out our recommendations on additional allocations. Our aim has been to achieve both balance and selectivity: identifying schemes for the reshaping of the science base which have the potential both for delivering excellent science and for shifting the system in directions appropriate for its development into the next century; and building a balanced portfolio of support for basic and strategic research with the prospect of significant scientific advance in selected fields. Throughout, we have given attention to the need to sustain and develop the supply of highly qualified manpower which the science base, and the nation generally, needs; and we are also recommending a few small schemes specifically for that purpose.

RESHAPING OF THE SCIENCE BASE

16. The central aim of our proposals for reshaping the science base has been to build on and draw together the strengths of both the approaches to research which characterise UK experience. We need to develop further the capacity of Research Council institutes to orchestrate continuing programmes of high quality research in fields of national importance. At the same time we need to sustain the flexibility and capacity for innovation inherent in our successful university research tradition. And, most important, we need to take active steps to infuse each approach with the strengths of the other. We welcome the Secretary of State's invitation to recommend now what further progress can be made in 1989-90, and to review and advise further next year on what more might be achieved in later years.

Research Council Restructuring

17. Research Councils have achieved important restructuring within previous resource levels (eg SERC's move of the Royal Greenwich Observatory to Cambridge); but additional allocations are needed if they are to make the faster progress which the Board judges necessary. Within the new Science Budget totals, we recommend the launch in 1989-90 of three major schemes for restructuring

Research Council institutes. Each offers the prospect of significant pay-offs in economic and scientific terms: increased effectiveness and a stimulus to world-class science for at least the next decade.

18. AFRC has made impressive progress in consolidating its work into eight new institutes but its plans to concentrate the work of each institute on only one or two sites - bringing greater coherence and synergy to its research programmes and achieving economies of scale - require a phased programme of investment in restructuring. The Board recommends that priority should be given to the consolidation of the Institute for Animal Health at Compton, at a cost of £3 million in 1989-90 and £4 million in each of the two subsequent years. These costs will be offset in part by capital receipts which will accrue after 1992. We are also attracted by proposals for the resiting of part of the Institute of Food Research on a university campus; but these are less advanced at present and we therefore intend to examine this scheme and possibly others in greater detail next year.

19. The Board strongly supports MRC's Clinical Research Initiative, with its major proposal for a new national centre linked with the Royal Postgraduate Medical School at Hammersmith. The Council has revised its original plans in response to our concern about their scale, heavy initial resource commitment and sole focus in London. Its revised, phased proposals should facilitate stronger and better managed programmes of clinical research, more effective integration of basic research work, and links with postgraduate training and postdoctoral career development of the highest quality. We recommend that £2m be allocated to MRC in 1989-90 to underpin the detailed planning and development of the project, and for some advance works. We will advise further next year on the precise sums needed in later years, after careful scrutiny of the detailed plans and taking account of the MRC's commitment to secure private funding for a fifth of the overall costs.

20. NERC places a high priority on its plans to relocate its Institute of Oceanographic Sciences from Wormley and its Research Vessel Services from Barry to a single site linked with the oceanography department of Southampton University (selected and funded by the UGC as a centre of excellence). The Board considers that this would add considerable value to the research activity of all three parts and that this location can offer the right combination of scientific excellence, first-class dock-side facilities and good working relationships with

industry. The Board has taken advice from the Coordinating Committee on Marine Science and Technology (CCMST) which strongly supports this proposal. On the understanding that the Department will undertake a careful appraisal of NERC's plans for management and financial control of the relocation arrangements and the new centre once established, the Board recommends allocations of £5.5 million in 1989-90, £6.0 million in 1990-91 and £6.2 million in 1991-92.

21. Apart from these three major schemes, the Board also recommends the allocation of funds to assist MRC with four building and rationalisation schemes, some of which involve private sector contributions. These concern the Anatomical Neuropharmacology Unit and the Biomedical and Clinical Magnetic Resonance Unit at Oxford University; the Dunn Nutrition Unit at Cambridge University; and the National Institute of Medical Research, which has to make extensive changes to its animal accommodation, partly in response to the Animals (Scientific Procedures) Act 1987. £3.6 million is recommended towards the costs of these schemes in 1989-90, followed by £2.0 million in 1990-91 and £1.1 million in 1991-92.

Interdisciplinary Research Centres

22. Interdisciplinary Research Centres (IRCs) were proposed in the Board's Strategy Advice as a new mode of support, providing for the management within universities of coherent programmes of research pursuing some of the important scientific opportunities arising in interdisciplinary areas. Eight IRCs have been established over the last year, or are in the process of being established: five by SERC, two by MRC and one by ESRC. The Secretary of State has welcomed the important start made with this initiative and expressed the hope that similar progress can be made in 1989-90.

23. The Board, too, has been impressed by the scientific community's response to the IRC initiative. There has been substantial activity in Research Councils and higher education institutions throughout the year, showing an enthusiasm for interdisciplinary activity and a commitment to larger-scale research programming that is both significantly greater than was previously apparent and profoundly encouraging for the future. Many good proposals for IRCs have emerged. But, equally important, the process has given rise to important new links between leading researchers, and it has caused many institutions to address more explicitly and more substantively than hitherto the implications of hosting a major research centre.

24. The proposals for IRCs have been developed progressively during the year and have been subject to increasingly selective and rigorous scrutiny. From several hundred initial schemes, the Councils eventually put forward nineteen proposals for consideration by the Board. From these we have selected nine as priorities for a start in 1989-90. All are clearly justified in relation to the criteria listed in our PES advice: offering more effective collaboration between Research Councils and universities in the deployment of research resources, and involving world-class scientists in interdisciplinary areas of burgeoning strategic importance. Most are within the fields we identified in May as offering particular potential for IRCs. Several involve collaboration between two or more Research Councils.

25. We remain convinced that the needs of the science base at present put a priority on the establishment of IRCs in the physical sciences and engineering. There is a dearth of focussed centres of research in these fields at present, and we recommend below the establishment of four more IRCs in the SERC's area of responsibility. But we have been delighted by the way in which the IRC concept has also been taken up in other fields, particularly as a means of effecting collaborative arrangements between university departments and Councils' own institutes and units with the prospect of integrated activity to a degree which might not otherwise be achieved. In several fields that call for urgent development excellent proposals have come forward which might previously have been funded under Councils' other modes of support. However, their development under the IRC banner is facilitating significantly better articulation both with university departments and with potential user interests. This desirable evolution of the unit-type mode of support is to be encouraged.

26. Five of the IRCs which we recommend should be funded for a 1989-90 start are thus in fields in which AFRC, ESRC, MRC and NERC have the lead responsibility. These are:

Transgenic Animal Biology - at Edinburgh University (AFRC with some MRC interest)

Microsocial Change to the Year 2000 - at Essex University (ESRC)

Cell Biology - linking Kings and University Colleges London and the MRC
Cell Biophysics Unit (MRC)

Macromolecular Interactions - linking Cambridge University and the MRC
Laboratory of Molecular Biology (MRC with AFRC and SERC involvement)

Population Biology - at Imperial College London (NERC with some AFRC
and MRC interest).

These IRCs will cost a total of £8.5m in 1989-90, £9.3m in 1990-91 and £8m in 1991-92.*

27. SERC's process for the selection and development of IRC proposals is, this year, slightly less far advanced than the other Councils' arrangements. Schemes in each of the following seven fields are currently in the final stages of detailed scrutiny:

- Process Simulation, Integration and Control (with AFRC involvement)
- High Performance Materials
- Optical and Laser Related Science and Technology
- Surface Engineering
- Polymer Science and Technology
- Applications of Parallel and Novel Architecture Computing
- Membranes, Membrane Function and Separation Processes (with AFRC involvement).

The Board has reviewed these outline proposals and information about the probable locations, key personnel and scientific programmes of IRCs in these fields. Whilst we are convinced of the scientific quality of proposals being elaborated, we noted also the Secretary of State's caution about the progress of this initiative. Accordingly we recommend that £7m in 1989-90, £11.2m in 1990-91 and £5.6m in 1991-92* be allocated to SERC for the establishment of four IRCs in the coming year. Arrangements have been made for Members of the Board to participate in the final selection of these centres.

* The cost estimates in paragraphs 26 and 27 reflect the Government's decision that all the additional funds for this second tranche of IRCs should be channelled through the Research Councils.

28. Subject to the Secretary of State's approval of the above recommendations, there will then be a total of 17 IRCs. The Board agrees that, at this point, it would indeed be appropriate to take stock. We thus intend to mount a major review of the progress of the IRC initiative, early in 1989, covering: the processes of initiating and selecting proposals for new IRCs; appropriate management structures; links with industry; Councils' on-going support, monitoring and evaluation arrangements; and possible fields for the establishment of further IRCs.

NEW SCIENTIFIC OPPORTUNITIES

29. We present this advice at a time of burgeoning worldwide scientific advance. But, as noted earlier, the UK cannot possibly afford to take up more than a fraction of the scientific opportunities that beckon. The IRCs and Research Council restructuring which we have recommended will provide a basis for world-class science in certain fields. They need to be complemented by a range of research programmes in others. In examining possibilities for the allocation of extra Science Budget funding the Board has been anxious to reconcile the need for selectivity and concentration with the provision of sufficient funds for curiosity-motivated research through the Councils' "responsive mode" arrangements and the small schemes of the other funded bodies. We are very conscious of the need to strike a balance between large scale funding of units etc, somewhat smaller scale and shorter term research programmes and the other activities necessary to, in the Secretary of State's words, "keep alive that excitement and excellence, particularly in basic science, for which the UK is rightly renowned." Our recommendations to this end are set out in the following paragraphs.

Research Programmes

30. The Board has given active encouragement in recent years to joint programmes involving collaboration between Research Councils in areas of strategic importance. Two such programmes - on Agriculture and the Environment and the Human-Computer Interface - have been fully developed and awaiting funding for some time. A third, on Geographic Information Systems, is also now ready to go ahead. All three programmes will involve high quality science in fields requiring new cooperative ventures. We recommend that a total of £2.5m in 1989-90 rising to £5.2m in 1991-92 be distributed between the five Councils for these programmes.

31. AFRC has developed a new major research programme in Plant Molecular Biology, which the Council considered as a possible IRC but decided would be better pursued as a coordinated programme involving different university departments. The Board recognises the importance of this programme for maintaining and developing the excellence of UK research in plant sciences and recommends allocations of £3.5m in 1989-90, £4.5m in 1990-91 and £6.0m in 1991-92.
32. The directed programme of AIDS research, for which funds have been earmarked by the Government, needs in our view to be complemented by additional funding for MRC's strategic programme of AIDS research. This would enable greater priority to be given to clinical and pathological research, especially neurological studies of AIDS and clinical trials. The Board recommends allocations of £2.6m in 1989-90, £3.2m in 1990-91 and £4.3m in 1991-92.
33. The Board also attaches high priority to MRC's proposals for an information and resource centre, and a related programme of directed research, aimed at mapping and sequencing the human genome. An allocation of £2.3m is recommended for 1989-90, followed by £4.1m in 1990-91 and £4.6m in 1991-92. In making this recommendation, the Board is conscious of the relevance of this initiative to other Research Councils, the medical charities and potential users - as regards computing and other technological developments as well as genetic biology. We will be encouraging MRC to continue to involve these other interests in its plans for the development of the initiative, and to build on its existing international links in this field.
34. NERC's proposals for additional funds to support the Biogeochemical Ocean Flux study and its North Sea Programme are warmly endorsed by the Board on scientific grounds. Their importance has been highlighted by recent Government concern about the greenhouse effect and marine pollution. Taken together, the Board's recommended allocations for these programmes amount to £4.3m in 1989-90, £2.6m in 1990-91 and £2.2m in 1991-92.
35. SERC has reviewed its research portfolio in the two important areas of materials and biotechnology. Whether or not an IRC is established on polymers, there will be a need for more research in this field; and further research will be needed in such areas as magnetic materials and low-dimensional solids. The Council's major review of its biotechnology programmes has identified the need for

more research on biosensors, biotransformations and other new initiatives. The Board recommends an allocation of £5m in 1989-90 to SERC for work in these areas, with additions of £7m in each of the subsequent years.

36. It is important to recognise that research undertaken within each of the programmes recommended above will be determined substantially in response to detailed proposals from individual scientists and teams of scientists. Nevertheless, improving the health of basic science requires that these "directed" programmes are complemented by general grant schemes which operate entirely in the responsive mode. Widespread - and, in the Board's view, justified - concern has been expressed throughout the scientific community in recent years about the scarcity of funding for the highest quality "alpha-rated" research grant proposals. The research programmes recommended above will go part way to alleviate this problem. And, in addition, the Board recommends supplementary allocations to the ESRC, MRC and SERC for their general grants schemes, totalling £8m in 1989-90, £11m in 1990-91 and £12m in 1991-92. We also recommend an annual allocation of £2m to the Royal Society so that it may reinstate its Small Grants Scheme, subject to a review in 1991. Taken together, these proposals are likely to have a very significant effect in raising both morale and productivity in the scientific community.

37. Finally, support for basic science needs to be balanced by continuing encouragement of activities designed to build collaboration between Research Councils and industry in areas with potential for exploitation and practical application. The Board therefore recommends additional funding for AFRC, MRC and SERC to increased their participation in the Government's inter-departmental LINK scheme - at a cost of £2.5m in 1989-90 rising to £5.1m by 1991-92.

Manpower

38. The Board expressed concern in its PES advice about the problems of meeting needs for very highly qualified manpower, both within the science base and the wider economy; and about particular difficulties concerning the deployment of scientific manpower and the career development of scientists. A study commissioned by the Board will contribute towards a coherent long-term strategy for tackling these problems and detailed advice will be offered next year. For the present, we recommend additional funding for a number of activities which will help to meet immediate and pressing needs for training and career development.

39. The Board recommends allocation of £1m in 1989-90 rising to £3.1m in 1991-92 to increase the numbers of postgraduate studentships offered by AFRC, MRC and SERC; together with £4.5m over the three years to enhance the MRC's clinical research training programme. This will permit postgraduate training of the highest quality to proceed in tandem with the Councils' priority research programmes.

40. We also recommend support for the career development of young scientists through the allocation of additional funds for the University Research Fellowship, Academic/Industry and International Exchange schemes of the Royal Society and Fellowship of Engineering. Together, these will require funding of £1.3m in 1989-90, £1.8m in 1990-91 and £2.2m in 1991-92.

Equipment

41. Some of the most pressing needs for research equipment have been met by the special allocation of £14m in 1988-89 to the Councils, Royal Society and UGC. But further expenditure on selective re-equipment is still necessary, especially to ensure the continued success of research in high priority fields. The Board has commissioned a survey of the present stock of academic research equipment and of identifiable deficiencies, and will offer further advice on equipment needs next year.

42. For the present, we recommend an allocation of about £3m to MRC in 1989-90 to meet the backlog of equipment needs in its units and institutes, such as for a new computing system at the National Institute for Medical Research and for nuclear magnetic resonance facilities at the Laboratory of Molecular Biology. And we recommend an allocation of £9m to SERC in 1989-90 to enhance the quality and effectiveness of the university research programmes it sponsors, and to allow such programmes to benefit from the most advanced data-gathering systems and new generation parallel-computing equipment. We expect that most of these funds will be allocated in responsive mode. Additionally, provision of £0.4m is recommended for enhancement of the Councils' Cray supercomputer.

Other Items

43. Finally, the Board wishes to recommend a range of minor allocations to support, inter alia, the relocation of AFRC's and ESRC's headquarters to Swindon,

SERC's contribution to the UK's subscription to ESA, and the Royal Society's public understanding of science programme. A full list is included in Annex A.

FLEXIBILITY MARGIN

44. The Board has given further careful consideration to the future need for its Flexibility Margin. The case for retaining a small reserve to facilitate worthwhile developments, to assist forward planning and to cater for contingencies remains very strong. This is manifest not least by the various points above on which the Board has committed itself to offering further advice on expenditure needs over the next year. We therefore recommend retention of a Flexibility Margin equivalent to about 2% of the total Science Budget in 1990-91 and 4% in 1991-92.

CONCLUSIONS

45. The Board's advice to Government in recent years has repeatedly emphasised the importance of a strong and healthy science base for the nation's economic competitiveness, environmental quality and social well-being. The Secretary of State has acknowledged this and, in his letter of 4 February to our Chairman, said that "if together we are able to construct a coherent strategy, allied to continued care and economy in the use of existing resources, it will be possible to give greater priority to science in this year's PES discussions." The Board believes that the substantial increase in the Science Budget which has now been announced represents a vote of confidence in the UK scientific community. We interpret it also as an expression of support for the strategic direction which we have outlined for the science base. The funds now available will enable that strategy to be carried forward with renewed vigour and greater certainty.

46. This present advice on the allocation of the enhanced Science Budget is designed to achieve a balance between the reshaping of the science base which we believe to be necessary and the pursuit of new scientific opportunities which will help maintain the UK's international reputation for scientific excellence. Concentration and selectivity in research funding will give a clearer focus to research effort, and offer greater potential for the significant scientific advances which will help determine the nature of our economy and society into the twenty-first century. But purposeful advance in selected fields must also be underpinned and complemented by first-class science across a broader range of endeavour.

SCIENCE BUDGET: RECOMMENDED ADDITIONS TO PREVIOUS PLANNING ALLOCATIONS

47. We have sought to strike an appropriate balance between support for curiosity-motivated research, which provides a fertile source for many of the most exciting advances in science, and strategic research programmes in fields where there is clear prospect of economic, social or environmental benefit. The one complements and enriches the other.

48. Our recommendations for the funding of research programmes to meet a selection of the scientific opportunities now apparent, for enhancement of schemes to develop highly qualified scientific manpower, for the establishment of further IRCs in important areas of strategic science, and for funds to make headway with restructuring of Research Council institutes, are each essential parts of this coherent overall strategy. Together they will provide the foundation for further advance, and we look forward to offering advice on that next year.

49. Annexes A and B, following, tabulate the additions to previous planning allocations which we recommend and the revised allocations which result. We commend these to the Secretary of State.

A. Interdisciplinary Research Centres

| | | | |
|-----------------------------------|-------------|-------------|-------------|
| Transgenic Animal Biology (AFRC) | 1.5 | 1.4 | 1.4 |
| Ecological Change (ESRC) | 0.3 | 0.2 | 0.2 |
| Cell Biology (MRC) | 2.0 | 1.9 | 1.1 |
| Macromolecular Interactions (MRC) | 2.0 | 2.3 | 0.8 |
| Population Biology (NERC) | 2.5 | 0.7 | 0.7 |
| 4 IRCs (SERC) | 7.8 | 11.2 | 5.4 |
| Sub-Total | 15.5 | 29.5 | 13.6 |

B. Research "Directed" Programmes

| | | | |
|---|-------------|-------------|-------------|
| Plant Molecular Biology (AFRC) | 3.5 | 4.5 | 6.0 |
| Agriculture and Environment (AFRC/ESRC/NERC) | 1.8 | 1.8 | 1.8 |
| Geographic Information Systems (ESRC/NERC) | 0.4 | 0.4 | 0.4 |
| Human Computer Interfaces (ESRC/MRC/NERC) | 0.3 | 1.3 | 1.6 |
| AIDS Strategic Programme (MRC) | 2.5 | 1.2 | 4.5 |
| Human Genome Mapping (MRC) | 2.3 | 4.1 | 2.5 |
| Biogeochemical Ocean Flux (NERC) | 2.7 | 1.3 | 1.3 |
| North Sea Programme (NERC) | 1.6 | 0.9 | 0.7 |
| New Initiatives in Materials and Biotechnology (SERC) | 5.0 | 0.4 | 1.8 |
| Sub-Total | 25.1 | 29.3 | 36.4 |

SCIENCE BUDGET: RECOMMENDED ADDITIONS TO PREVIOUS PLANNING ALLOCATIONS

| | £ million | | |
|--|-----------|---------|-----------|
| | 1989-90 | 1990-91 | 1991-92 |
| 1. "Earmarked" Additions | | | |
| British Geological Survey (NERC) | 3.0 | 4.0 | 5.0 |
| British Antarctic Survey (NERC) | 9.7 | 8.5 | 4.8 |
| CERN (SERC) | 9.3 | 7.3 | 7.3 |
| AIDS Directed Programme (MRC) | - | 8.0 | 8.5 |
| VAT on Construction Costs (All Councils) | 1.8 | 1.3 | 1.2 |
| Redundancy Costs as result of Reduction in MAFF Commissions (AFRC) | 3.0 | 4.0 | 6.0 |
| Sub-Total | 26.8 | 33.1 | 32.8 92.7 |
| 2. Research Council Restructuring | | | |
| Institute for Animal Health (AFRC) | 3.0 | 4.0 | 4.0 |
| Clinical Research Initiative (MRC) | 2.0 | - | - |
| Anatomical Neuropharmacology/Dunn Nutrition/Clinical Magnetic Resonance/ NIMR Animal Accommodation (MRC) | 3.6 | 2.0 | 1.1 |
| Relocation of IOS and RVS (NERC) | 5.5 | 6.0 | 6.2 |
| Sub-Total | 14.1 | 12.0 | 11.3 37.4 |
| 3. Interdisciplinary Research Centres | | | |
| Transgenic Animal Biology (AFRC) | 1.5 | 1.6 | 1.6 |
| Microsocial Change (ESRC) | 0.5 | 0.8 | 0.8 |
| Cell Biology (MRC) | 2.0 | 3.9 | 4.1 |
| Macromolecular Interactions (MRC) | 2.0 | 2.3 | 0.8 |
| Population Biology (NERC) | 2.5 | 0.7 | 0.7 |
| 4 IRCs (SERC) | 7.0 | 11.2 | 5.6 |
| Sub-Total | 15.5 | 20.5 | 13.6 |
| 4. Research: "Directed" Programmes | | | |
| Plant Molecular Biology (AFRC) | 3.5 | 4.5 | 6.0 |
| Agriculture and Environment (AFRC/ESRC/NERC) | 1.8 | 1.8 | 1.8 |
| Geographic Information Systems (ESRC/NERC) | 0.4 | 0.4 | 0.4 |
| Human Computer Interface (ESRC/MRC/SERC) | 0.3 | 1.5 | 3.0 |
| AIDS Strategic Programme (MRC) | 2.6 | 3.2 | 4.3 |
| Human Genome Mapping (MRC) | 2.3 | 4.1 | 4.6 |
| Biogeochemical Ocean Flux (NERC) | 2.7 | 1.7 | 1.5 |
| North Sea Programme (NERC) | 1.6 | 0.9 | 0.7 |
| New Initiatives in Materials and Biotechnology (SERC) | 5.0 | 7.0 | 7.0 |
| LINK: AFRC | 1.0 | 1.0 | 1.0 |
| MRC | 0.7 | 0.7 | 0.7 |
| SERC | 0.8 | 2.5 | 3.4 |
| Sub-Total | 22.7 | 29.3 | 34.4 |

| | £ million | | |
|--|-----------|---------|---------|
| | 1989-90 | 1990-91 | 1991-92 |
| <u>5. Research Grants: Responsive Mode</u> | | | |
| ESRC | 0.5 | 0.5 | 0.5 |
| MRC | 1.5 | 2.5 | 3.5 |
| SERC | 6.0 | 8.0 | 8.0 |
| Royal Society Small Grants Scheme | 2.0 | 2.0 | 2.0 |
| Sub-Total | 10.0 | 13.0 | 14.0 |
| <u>6. Manpower</u> | | | |
| Research Studentships: AFRC | 0.2 ✓ | 0.4 ✓ | 0.6 |
| MRC | 0.2 ✓ | 0.5 | 1.0 |
| SERC | 0.6 ✓ | 1.2 | 1.5 |
| Clinical Research Training (MRC) | 0.5 ✓ | 1.5 | 2.5 |
| University Research Fellowships (Royal Society) | 0.4 | 0.8 | 1.1 |
| Research Fellows' Expenses (Royal Society) | 0.5 | 0.5 | 0.6 |
| Japan + Western Europe Exchanges (Royal Society) | 0.2 | 0.2 | 0.2 |
| Various Schemes (Fellowship of Engineering) | 0.2 | 0.3 | 0.3 |
| Sub-Total | 2.8 | 5.4 | 7.8 |
| <u>7. Selective Re-equipment</u> | | | |
| Re-equipment of Units and Institutes (MRC) | 2.9 | - | - |
| Cray Enhancement (SERC) | 0.4 | - | - |
| Equipment for University Research (SERC) | 9.0 | - | - |
| Sub-Total | 12.3 | - | - |
| <u>8. Other</u> | | | |
| HQ Relocation (AFRC + ESRC) | 1.7 ✓ | 1.6 | - |
| ESA Subscription (SERC) | 0.1 ✓ | 0.4 | 0.7 |
| Operating Costs (Royal Society) | 0.1 | 0.2 | 0.2 |
| Public Understanding of Science (Royal Society) | 0.03 | 0.03 | 0.03 |
| Redundancies - pension consequences (NERC) | 0.8 ✓ | 1.3 | 1.3 |
| Sub-Total | 2.7 | 3.5 | 2.2 |
| TOTAL ADDITIONS ¹ | 106.9 | 116.8 | 116.1 |

¹ Includes distribution of the Board's 1989-90 Flexibility Margin

SCIENCE BUDGET: RECOMMENDED ALLOCATIONS FOR 1989-90 AND PLANNING
FIGURES FOR 1990-91 AND 1991-92

| | £ million | | |
|---------------------------|-----------|---------|---------|
| | 1989-90 | 1990-91 | 1991-92 |
| AFRC ¹ | 76.3 | 78.2 | 81.7 |
| ESRC | 32.0 | 32.4 | 31.6 |
| MRC | 176.3 | 181.4 | 184.5 |
| NERC | 123.4 | 106.2 | 103.3 |
| SERC | 404.8 | 410.2 | 407.0 |
| Royal Society | 11.64 | 12.29 | 12.73 |
| Fellowship of Engineering | 0.97 | 1.04 | 1.11 |
| Science Policy Studies | 0.11 | 0.12 | 0.12 |
| CEST | 0.08 | 0.08 | 0.08 |
| Flexibility Margin | - | 15.7 | 33.6 |
| TOTAL ¹ | 825.6 | 837.6 | 855.8 |

¹ Includes transfer of approximately £1m a year from MAFF subsequent to Secretary of State's announcement of Science Budget totals.

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, FRS (Chairman) | - | Professor of Molecular Biophysics, University of Oxford. |
| Professor R L Bell, CB | - | Director-General of ADAS, Ministry of Agriculture Fisheries and Food. |
| Sir Walter Bodmer, FRS | - | Director of Research, Imperial Cancer Research Fund. |
| Dr R F Coleman | - | Chief Engineer and Scientist, Department of Trade and Industry. |
| Professor Sir Roger Elliott, FRS | - | Physical Secretary, and Vice President to the Royal Society; Wykeham Professor of Physics, University of Oxford. |
| Mr J Fairclough, FEng | - | Chief Scientific Adviser, Cabinet Office. |
| Dr D J Fisk | - | Chief Scientist, Department of the Environment. |
| Mr J S Flemming | - | Associate Director and Chief Economist to the Governor, Bank of England. |
| Professor J L Knill | - | Chairman, Natural Environment Research Council. |

| | | |
|--|---|---|
| Dr P Mathias, CBE, FBA | - | Master, Downing College, University of Cambridge. |
| 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 and Social Security. |
| Dr D A Rees, FRS | - | Secretary, Medical Research Council. |
| Dr D H Roberts, CBE, FEng, FRS | - | Joint Deputy Managing Director (Technical), General Electric Company. |
| Professor W D P Stewart, DSc, FRSE, FRS | - | Secretary, Agricultural and Food Research Council. |
| Sir Peter Swinnerton-Dyer, KBE, FRS | - | Chairman, University Grants Committee. |
| Sir Francis Tombs, FEng | - | Chairman, Rolls-Royce Ltd; Chairman, ACOST. |
| Sir Alwyn Williams, FRS | - | Formerly Principal and Vice-Chancellor, University of Glasgow. |
| Sir Martin Wood, OBE, FRS | - | Deputy Chairman, Oxford Instruments Group Ltd. |
| Mr J M M Vereker | - | DES Assessor. |
| Mr D W Tanner | - | DES Assessor. |
| SECRETARY | | |
| Mr P J Thorpe | | |

ABRC ADVICE ON ALLOCATION OF THE SCIENCE BUDGET 1989-92

Introduction

1. The Secretary of State announced on 1 November 1988 that the Science Budget for 1989-90 would be £825 million, with planning figures for 1990-91 of £837 million and for 1991-92 of £855 million. This represents increases of about £100 million a year on the Government's previous expenditure plans. It implies spending which, in real terms, is 11%, 9% and 8% respectively above the level in 1988-89. The Secretary of State also announced the allocation of an extra £14 million for urgently needed equipment for basic science in 1988-89, divided between the Research Councils, the Royal Society and the UGC.

2. Subsequently, the Secretary of State wrote to the Chairman of the Board confirming these increases in the Science Budget; setting out the Government's views on funding for the British Geological Survey, the British Antarctic Survey, CERN and research on AIDS; commenting on the Board's proposals for additional expenditure on interdisciplinary research centres, restructuring of Research Council institutes, and for new scientific opportunities; and inviting the Board's advice on the detailed allocation of the enhanced Science Budget provision. This letter of 11 November has been published.

3. This paper 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 1989-90; for later years, Councils and other bodies need provisional indications of likely allocations, for planning purposes. The Board's recommendations on these are summarised in Annexes A and B.

Board's Reaction

4. The Board is greatly encouraged by this substantial increase in provision for the Science Budget, and by the Secretary of State's clear statement of the Government's continued commitment to maintain and enhance the strength and quality of the science base. The Board particularly welcomes the Government's recognition that maintaining the excellence of basic and strategic science and renewing the cadre of very highly qualified scientific manpower are vitally important for the nation's economic and social well-being. This will do much to

raise morale in the scientific community. The additional resources made available will provide for many of the scientific initiatives which the Board has proposed and for a worthwhile start on implementing an effective strategy for the future development of the UK science base.

5. The Board notes, however, that whilst the settlement brings a substantial 13% uplift in the baseline provision for the Science Budget, the planning figures announced for 1990-91 and 1991-92 imply a 3% reduction in real terms over the two years, after allowing for inflation at the level forecast by Government for the economy generally (the GDP deflator at market prices). This would imply a significant reduction in the volume of science which the Councils can support. We therefore welcome the Secretary of State's statement that these planning figures will be reviewed in the normal way as part of the Government's annual Public Expenditure Survey. With that assurance, the new plans provide an excellent foundation for the effective restructuring and development of UK science and we look forward to the opportunity of advising Government on how that might be built upon.

EARMARKED ADDITIONS

6. 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 recognise that additional funding for such programmes is in effect earmarked. The following paragraphs comment on six items which we have thus regarded as a first charge on the increase in the Science Budget. We are pleased to note that the sums involved total only about a quarter of the extra resources now available. In previous years such items have absorbed nearly all the additional funding.

British Geological Survey (BGS)

7. Following consideration of the report which the Board commissioned from a working group chaired by Sir Clifford Butler, the Government has decided that the BGS should remain as a part of the NERC, and that it should have a core programme of surveying. Pending the detailed definition of this programme and a review of the Survey's funding arrangements and charging policies, the Council will be allocated an additional £3m in 1989-90, £4m in 1990-91 and £5m in 1991-92 to support BGS.

