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PRIME MINISTER

**E(A) DISCUSSION OF R & D PRIORITIES : 10 JULY**

1. I am circulating with this minute a summary of a recent report by the Advisory Board for the Research Councils (ABRC) which considers some of the implications of our current financial policies for scientific research supported through the Research Councils and the University Grants Committee. Copies of the Report are being sent separately to Private Offices.
2. The ABRC advises me on civil science within my responsibility that is, on the nation's science base. The Board is a distinguished body including in its membership eminent scientists and engineers both from academia and from industry.
3. The nation's science base provides the knowledge, the skills and the people essential for their effective development and application, which crucially underpin our increasingly science-based economy. Most basic or pure research has potential applications in the economy although these cannot always be predicted or foreseen. It is essential for major innovations such as superconducting magnets and diagnostic imaging; and the diminishing interval between understanding and application makes the traditional dichotomy between pure and applied damagingly irrelevant. The Research Councils are substantially involved in research across the whole spectrum of work which aims to create new enabling or generic technologies on the basis of the latest advances in fundamental knowledge. Star Wars has its peaceful counterparts; it is not, now, fantasy to imagine a UK agro-bio-medical industry harvesting fields of plants genetically transformed to produce, say, insulin.
4. With the encouragement of the Board, the Research Councils have made and are making great efforts to restructure around high priority areas and to promote technology transfer. Over the last decade the proportion of the Science and Engineering Research Council's resources devoted to big science (astronomy,

space and nuclear physics) has dropped from 70% of its budget to 40%; the recent Kendrew Report argues that the UK should further reduce involvement in high energy particle physics and give greater priority to areas of science of greater early economic relevance. Other Councils are redeploying substantial tranches of their resources. But the Councils are reaching the limits to redeployment; it costs money and takes time. And they must retain a balanced portfolio if we are not to suppress - to our lasting damage - intellectual creativity or to risk driving our best scientists abroad. Science is international and scientists mobile. Japan has launched on a policy of building up its basic research capabilities. Our best human capital is exposed to an international market: the SDI initiative is already making its presence felt in the UK universities.

5. The Board rightly brings these matters to public notice. In the wider context its report prompts the question whether our policies for the science base risk running counter to our larger economic interests built on a science and technology based economy.

6. I am sending copies of this minute to all Ministers who will be attending E(A) on 10 July; and to Sir Robin Nicholson.

KJ

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4 July 1985

## SCIENCE AND PUBLIC EXPENDITURE

### REPORT FROM THE ADVISORY BOARD FOR THE RESEARCH COUNCILS

#### SUMMARY

1. Although the Science Budget has grown in real terms by 6% since 1981-82, the Budget is buying less science than it did. This is because the costs of certain overheads such as superannuation and foreign exchange have grown significantly faster than general inflation.
2. In addition the cost of science itself is growing faster than inflation because the equipment and materials required to stay at the forefront of research are becoming more sophisticated.
3. The Board estimate that the value of the Science Vote in terms of the amount of science it can support has fallen by 5% since 1981-82 and that on present plans the total reduction during the 1980s will be some 10%.
4. The report notes that research in the universities funded through the University Grants Committee (half of the UK's science base) has been reduced by more than this: since 1981-82 universities' funding has been reduced by 8% in real terms.
5. The report says that this reduction in the UK's science base matters because:
  - i) it is preventing adequate investment in new areas of science which are crucial to developing technologies for the industry of tomorrow, at a time when our major industrial competitors are increasing their investment in these areas;
  - ii) although greater concentration of the UK science base on selected promising areas is required, the nation needs to maintain some research capacity across the range of science because of the impossibility of foreseeing when and where the next major scientific breakthroughs will come;
  - iii) a further reason for maintaining a broad science base is that as technology becomes more sophisticated successful exploitation depends increasingly on having people in the UK with research training in the related basic sciences: if we do not offer research opportunities for our brightest young people more of them will go abroad. The Board believe that outstanding young scientists

and engineers are already leaving Britain at an increasing rate, without corresponding inflow from abroad;

iv) it is unwise to assume that the UK can rely on piggy-backing on other countries' research investment: greater awareness of the commercial potential of research is likely increasingly to reduce the free circulation of the results of scientific research.

6. The Board say that most branches of physics and chemistry are of strategic importance in relation to the engineering and chemical industries; and almost all fields of biology from molecular genetics to mathematical ecology are potential contributors to medicine, agriculture, the food processing industry and management of the environment. "Science is now so pervasive and the applications of science so widespread that most basic science is relevant to the practical needs of society." The report also points to great strides which the Research Councils have made in recent years in developing links with industry.

7. The report describes the response of the Research Councils to financial pressures. All Councils are producing forward strategy documents or corporate plans and are committed to greater selectivity and flexibility. Restructuring in the Councils will entail the loss of 2,000 jobs (20%) in the 5 years to 1987-88.

8. Despite these measures the Research Councils find that they have not got the money needed to exploit effectively new areas of research while at the same time maintaining adequate funding for existing core programmes and facilities; and financing restructuring.

9. The Board identify a number of areas of research in which they argue further investment is needed over and above present plans for the Science Vote. The Board selected these areas against the following criteria:

a) the potential in the medium term for results of application to UK industry; scope for collaboration with industry in undertaking the research;

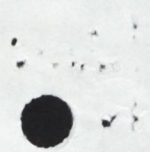
b) extent to which proposals would stimulate research (and research training) in the universities through the provision of equipment and facilities;

c) extent to which proposals would bring together different branches of expertise relating to separate scientific disciplines (in virtually all fields, the joining together of different scientific streams is becoming increasingly important for advance).

10. The additional bid put forward by the Board in their report against these criteria amounts to £15m in 1986-87 rising to £40m by 1988-89. This is equivalent to a rise in the Science Budget over present plans of 2.5% in 1986-87 and 6.5% in 1988-89.

11. The report concludes:

"We find it disturbing that, during a period when the UK's publicly funded investment in civil research has fallen in real terms, there are indications that our major industrial competitors have been increasing their investment. The economic and industrial effects on the UK of this may not become obvious for a few more years. However, we would warn the Government that when they do, they are likely to be grave and effectively irreversible."



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