

April 1996

Ref:

Research Capability of the University System

This is a summary of a new report entitled *The Research Capability of the University System*. The report has been produced by a group chaired by Dr David Harrison and comprising Professor Alastair Bellingham, Professor John Davies, Professor Barrie Jay, Professor Alistair MacFarlane, Professor Margaret McGowan, Dr Brian Manley, Professor Stephen Nickell and Sir Ronald Oxburgh. The Group was appointed by the National Academies Policy Advisory Group (NAPAG), which consists of the British Academy, the Conference of Medical Royal Colleges, The Royal Academy of Engineering and the Royal Society. The study was financed in part by the Office of Science and Technology.

Research is the advancement of learning, the discovery of new knowledge or new associations between events or phenomena already known. It is original in nature and its greatest achievements enjoy a lasting and world-wide recognition and contribute to the quality of life. A national research base is a loose community of researchers and scholars in universities, industry, Government and private research institutes. To be effective they have to interact both with each other and with those who can benefit from their research. The research base as a whole should:

- contribute to the growth of knowledge
- disseminate knowledge
- make useful inventions
- evaluate and exploit the research bases of other countries
- help inform public opinion

It is commonly accepted that British contributions to the growth of knowledge have been substantial and of high quality. On the other hand the inability to disseminate ideas and expertise effectively within the research base in the UK, particularly between universities and industry, has been widely acknowledged. The White Paper *Realising Our Potential* (Cm 2250) contained proposals designed to address such problems, largely from the university side.

This report examines the factors affecting the future research capability of the university system. The White Paper, and subsequent initiatives intended to carry forward its proposals, provide part of the background to this undertaking, since it is pertinent to ask how the demands they place on universities can be met. Further background comes from the many changes in the university system over the past decade or more, which have a direct bearing on their future research capability. **The report concludes that the present university system will not be able to deliver what is being required of it.** In particular: funding for research is not competitive by international standards; student/staff ratios allow inadequate time for

research; and all aspects of university infrastructure are being dangerously eroded. The report makes recommendations for addressing some of these issues.

The British research base is principally supported from four sources in Government, industry, charities and the EU. The table on page 2 lists those who carry out UK research and development (as gross expenditure on R & D) and those who fund it.

For the major research universities a substantial part of their research support comes on a project-by-project competitive basis, each proposal having been peer-reviewed or assessed by its sponsor. Significant research support from Government to all universities, however, is allocated through Funding Councils on the basis of past research performance, and is reviewed retrospectively through the national Research Assessment Exercise (RAE).

The management and the balance of research in British universities have been changed, by the RAE and by other changes initiated in the White Paper. Some of the changes were inevitable in so far as the traditional methods of funding university research became progressively less affordable as the teaching side of the pre-1992 university system expanded by 45% in the five years to 1993-94. The result has been a system in which there has been much greater selectivity in the allocation of research funds.

There also has developed a greater emphasis on accountability for research funding and clarity about the true costs of carrying out research. There is a much wider interest in seeking industrial partners for university work and direct industrial support. There has, however, been an increase in work that is directed towards more closely defined and short-term objectives than in the past.

There have been some undesirable consequences of the RAE. The formulae that govern the allocation of HEFC research funds have, not surprisingly, led institutions to patterns of action that are designed to optimise their funding allocations, but which on more general grounds may be unwelcome. These range from a distortion of internal procedures intended to bring advantage in the funding formulae, through initiatives that maximise the numbers apparently involved in research (thus incidentally making it appear less efficient), to marked effects on staff recruitment and retention policies. In many universities the time horizon imposed by the RAE is often inappropriate, militating against more speculative research.

One of the main outcomes of the White Paper was the Technology Foresight exercise, in which senior and experienced figures from all parts of the research base met in fifteen subject area panels. They discussed the relative value and potential for wealth creation of investment in different areas of research, and the results of the exercise have now been published. Both the Funding Councils and the Research Councils have been instructed to take the outcomes of Foresight into consideration when deciding on the allocation of research funds.

A further consequence of the White Paper is that the Research Councils have undergone a substantial change in outlook and in their relationship with the university sector. Within their new terms of reference there is emphasis on the applicability of the work they support and, although there is recognition of the need to support individuals who have good ideas (so-called responsive mode support), the funds to support such work have in practice been restricted.

We believe that universities retain a central role within the research base of the country. They must remain the suppliers of people to the research base. They are uniquely placed to carry out research that is speculative in nature and from which the economic return, if any, may in some cases come decades later. This does not, however, mean that they should exclude short-term and more applied work. However, if longer-term work is not done in universities it is unlikely to be done anywhere. Universities are free to write their own mission statements and many include research as an important objective. It is clear that, even on the most optimistic financial projections, there would be insufficient funds to satisfy all declared ambitions. Nor is it clear to us that it would be desirable for this to happen; funding methodologies should therefore promote diversity in the university system. We believe that this means that **research funding from Government sources should be selective, and that the degree of selectivity will reflect the lack of resource.**

The work of academic staff in universities fulfils a number of different functions. These differences should be recognised in funding allocations. In particular we support the view that in order to teach effectively at university level, staff need both the time and resources to conduct advanced study and other professional activities. This is not to say that they should all be research stars and necessarily funded to carry out any research they choose. **We recommend that an element of the Funding Council research funding ñ presently of the order of £50 million a year ñ should be allocated for professional development and teaching to subject units of assessment which (a) have student/staff ratios above the national average, and (b) did not enter the most recent RAE.**

We believe that there is advantage in having a significant component of university research funding that is reviewed retrospectively as is the main Funding Council research allocation today. This allows university academic staff the freedom to pursue a limited amount of work with a continuity in the long term and to do so in fields that may happen to be particularly innovative, or inter-disciplinary or simply unfashionable. **We recommend that accountability for the research funds at present allocated by Funding Councils should continue to be retrospective.**

We believe that it is in the national interest that research should be supported adequately even if this means reducing the volume. We recommend in particular that urgent attention be given to capital needs of universities for libraries, modern equipment, building maintenance and the requirements of statutory authorities.

The new role of the Research Councils in supporting university research gives some cause for concern. Previously they operated in a largely responsive mode with an implicit duty of care for the university element of the national research base. They now have an arm's-length approach to universities and carry an obligation to procure programmes of research to the national benefit. We believe that this is a heavy responsibility and that, in particular, the Councils should view the outcomes of the Foresight exercise as only one consideration in the distribution of funds between fields of activity. **We consider that the Research Councils should have a duty of care for those parts of the research base that fall within their province** and that they should formulate their funding policies to take account of other sponsors of research (i.e. industry, EU, charities).

The costs of conducting research vary greatly both within and between fields. The Research Councils have recently reviewed the distribution of funds between fields and similar moves by the Funding Councils are to be welcomed. In the latter case, the funding available for a whole area does not presently reflect either the quality or number of researchers in that field but rather an historical allocation to the field at a time when circumstances may have been different from those of today. **We recommend that the Funding Councils should continue to review the distribution of funding between academic fields.**

The overall level of support for the research base is the aggregate from a number of sources. The contribution from industry will to some extent reflect Government taxation and incentive policies, together with company size, and the nature of the business. Government too is a major procurer of research to meet its various departmental needs in areas which include defence, environment, health, and transport. We recognise that the pressure on both industry and Government departments must be to spend as little on research as is compatible with meeting both their current and longer-term requirements. **We therefore recommend that Government should seek through benign taxation policies to encourage industry to invest in research** and that, in its spending on research for its own purpose, it pays more attention to long-term needs.

Whereas the level of research support in industry or in Government departments can to a greater or lesser extent be defended in terms of tangible and measurable benefits, any particular level of general Government support for the research base through the Funding and Research Councils is harder to justify in this way. It is not that the benefits are intangible, but that they are much longer term, so much so that few of those involved in determining research funding, whether Ministers or officials, are likely to have to live with the consequences of their decisions. For this reason industry sees it as the clear responsibility of Government to support such research out of general taxation. To some extent the level of support is partly influenced by our competitor nations. Our best researchers should not feel that the only way that they can find an environment in which they can do top class work is to go abroad permanently, thus weakening our own research base. **We urge Government to bear in mind the scale and nature of support afforded to the research base in other countries when determining its contribution to the research base in the UK.**

Ultimately in research it is quality not quantity that matters. This means that, for any given level of support, the work supported must be the best and must be supported fully i.e. as well as anywhere in the world. Therefore the more that funds are restricted, the more severe will the selectivity have to be. This will be unpopular, but it is inescapable. For research, whether it is done in universities or elsewhere, continuity and stability of support are as important as the precise level. As the success of long-term Japanese research initiatives has shown, patience is essential.

Research, particularly in scientific and technological areas, is very important for industry and will help wealth creation; but it is essential not to be caught in the late 20th-century mind-set that industry is the only, or even the main, beneficiary. Living with technology will be the challenge of the next century: in health, environment and social policies, a proper understanding will help to improve the quality of life.

Copies of the report, *Research Capability of the University System* (ISBN 0 85403 502 8), may be obtained from the Publication Sales Department at the Royal Society, 6

Carlton House Terrace, London SW1Y 5AG (<http://pubs.royalsoc.ac.uk>), tel 0171-839 5561, fax 0171-976 1837), price £20.00 inc p&p.