UK research

Catalogue of scarcity

THE ability of the British academic community to undertake fundamental research to international standards is being seriously damaged at all levels. Moreover, older researchers are stopping work prematurely while younger members are leaving to work abroad in abnormal numbers.

These are two conclusions of a detailed study of the research grants awarded over the past few years by the Science and Engineering Research Council (SERC) which highlights the significant proportion of grant applications, judged by peer review to be of the highest calibre, that have had to be turned down for lack of funds.

As well as collating and analysing statistics of SERC's grant awards, the steering group that prepared the report commissioned six consultants to visit research centres and monitor the peer review process. The report concentrates on the activities of the Science Board (which supports research in physics, chemistry, biology and mathematics and related fields) and the Engineering Board, touching only briefly on the Astronomy, Space and Radio and the Nuclear Physics Boards.

Grant proposals to all the boards are graded by SERC into three categories: alpha (to be supported "at all costs" for their scientific merit and, in engineering, for their potential industrial applicability), beta (sound science to be supported if money is available) and gamma (to be rejected). Until the financial year 1978-79, all alphas and some betas were supported. Since then, some alphas have been turned down every year, even though the alpha standard as applied in SERC's peer review process has risen during the period of the study. Predictably, the number of grant applications as a whole to SERC has risen as other sources of funds have diminished, particularly for chemistry, physics and biology.

The report says that further strains have arisen from the significant decline in the support for university departments by the University Grants Committee (UGC) under the "dual support system". As a result of the substantial decline in UGC's general grant, academic staff have heavier teaching loads, thus increasing the need for SERC to support research staff.

The statistics show that, although the demand for grants has varied considerably between disciplines (and the number of grants recommended for funding in the

alpha category roughly *pro rata*), more than 20 per cent of alpha applications in most subject areas in 1982-83 were left without support.

Care is required in the interpretation of the figures because some of the applications (about 10 per cent in some fields) are alpha-rated proposals resubmitted from previous years, but the report emphasizes the dangers of the resulting delays in competitive fields. It also says that the trends after adjustment to 1982-83 prices underestimate the purchasing power of earlier

periods because salaries have risen faster than inflation.

In many areas, the ability to fund alpha proposals is reported to have diminished further in the current year. The report concludes that the council's capacity to respond to proposals for high quality research — particularly unsolicited applications containing novel ideas that might lead to significant developments in the future — is being seriously undermined. The report recommends the immediate allocation of extra money, particularly for unsolicited proposals; it also recommends that the movement abroad of researchers be monitored systematically.

Philip Campbell

Where the cuts fall

Details of the impact of budget shortages in different areas as follows:

● **Physics.** Following the Vinen report in 1982, the Science Board attempted to offset a perceived decline in the activity of the UK physics community. Nevertheless, although the demand for grants has risen steadily, the available funds have decreased by 9 per cent in real terms so that, by 1982-83, the proportion of alpha applications refused had risen to 28 per cent by number. Types of proposals particularly affected have included those representing changes in direction of research groups or new ideas coming from exceptionally able younger individuals.

● **Chemistry.** In contrast with previous years, the chemistry community is almost entirely dependent on SERC for financial support, so that the number of applications has increased significantly. In 1982-83, the proportion of alpha proposals unsupported was 29 per cent. According to the report, about 40 per cent of the chemists whose alpha-rated applications were refused afterwards abandoned them completely. Problems have arisen particularly when sophisticated instruments such as mass spectrometers, which can be of use to a department as a whole, become essential but cannot be provided. The report points to a trend of opting out, early retirement or emigration to Europe.

● **Biology.** Although the biological sciences are supported by all four science research councils, as well as outside sponsors, SERC is expected to support fundamental research which other sources (devoted to a more applied emphasis) will not provide for. In the context of a steadily increasing demand, the proportion of alpha proposals unfunded in 1982-83 was 17 per cent. The report highlights a significant number of researchers leaving the United Kingdom. It also points to the "sophistication factor" as a result of which, for example, the demand for costly nuclear magnetic resonance equipment has risen considerably. Small departments suffer particularly when SERC can provide only part of the cost of a major piece of apparatus, and the balance cannot be found.

● **Mathematics.** In 1982-83, SERC supported about 5 per cent of the mathematics community, UGC providing the majority of the balance (as is traditional). But the demand has been rising, partly because of the increasing use of computers by pure mathematicians. The proportion of alpha proposals unfunded had risen sharply by 1982-83 to 49 per cent.

● **Materials Science.** A rise in demand of 42 per cent since 1980-81 has been accompanied by a continuous fall in support, with the result that the proportion of alpha applications unfunded in 1982-83 was 43 per cent. The report also says that, while many researchers are able to tailor unsuccessful proposals for industrial applicability and obtain alternative support, this trend is adversely affecting fundamental research.

● **Engineering.** As with materials science, the unrequited alpha problem has, according to the report, been compensated for to some extent by industrial support at the cost of more fundamental research. The average engineering grant request (£36,000) exceeds that in science (£27,000) mainly because of higher demand by the engineers for technicians and research assistants. The consultants say that this is justified. Over the past decade, SERC has given particular encouragement to engineering and it is only very recently that the alpha problem has emerged. The report predicts that the number of combined (CASE) grants jointly sponsored by industry and SERC will decrease.

● **Astronomy, Space and Radio Board.** In 1982-83, the proportion of alpha proposals not supported was 17 per cent, but in the previous two years it had been about 24 per cent. The report points out that the ASR board has a number of large-scale continuing grant commitments which squeeze other applications, significantly increasing the proportion of ordinary alpha grants unsupported.

● **Nuclear Physics Board.** Although no details are provided, the steering group reports that the problem faced is comparable with that of the ASR board.

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Steering group members

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