The Save British Science Society

29-30 Tavistock Square, London, WC1H 9QU
Tel: 020 7679 4995 Fax: 020 7916 8528

SBS 05/02

SAVING STRATEGIC SCIENCE

SBS response to the House of Commons Science & Technology Committee's inquiry into strategic science provision English universities

1. Save British Science is pleased to submit this evidence to the committee's inquiry into strategic science provision. SBS is a voluntary organisation campaigning for the health of science and technology throughout UK society, and is supported by over 1,500 individual members, and some 70 institutional members, including universities, learned societies, venture capitalists, financiers, industrial companies and publishers.

2. We deal with each of the Committee's points in turn.

HEFCE's research funding formula

3. Following the Research Assessment Exercise in 2001, HEFCE summarily cut funding for departments rated as nationally excellent. The contract the universities believed they had been promised was broken. It turned out to be untrue that by working hard to improve the rating of a department previously graded 3 in the exercise, a university would be rewarded. It appeared that nationally excellent research is no longer considered worthy of investment.

4. It is no longer possible to sustain a science department on teaching funding alone, as we describe below when dealing with the implications of changing the weightings given to science subjects in the teaching funding formula.

5. This means that, without some research investment, it is practically impossible to sustain a department in a subject such as engineering, chemistry, physics or biology. It is certainly impossible for an individual university to sustain a portfolio of sciences.

6. It is still possible to sustain at least some arts or humanities departments without research funding, so cutting funding for nationally-excellent research in these fields, while just as undesirable in itself as cutting science departments' funding, has not had the same immediate effect on the viability of departments.

7. Although it is too late to change the past, we feel it is important to analyse the events that led to the cutting of funding for nationally-excellent departments. The reason given was that average gradings had increased and that, within finite financial limits, it was not possible to maintain absolute levels of funding for each grade.

8. While this was clearly arithmetically true, it was hardly a secret that ratings were likely to increase on average. Raising standards is, after all, seen as part of the point of the exercise. Moreover, the empirical evidence was that grades increased in every previous assessment. HEFCE could, and should, have planned for this.

9. The tens of millions of pounds that were used on the unsuccessful e-university would have made a good starting point as a source of funds to ensure that nationally-excellent research was preserved.

The desirability of increasing the concentration of research into small number of universities

10. At a time when the costs of doing some kinds of research are becoming enormous, the concentration of research is to some extent inevitable. Only a small number of institutions can carry out expensive particle physics, for example, and only a small number of institutions will be able to rival the world's best across a broad range of disciplines.

11. However, the current policy appears to be to concentrate all scientific and engineering research in an ever-decreasing number of departments, even though the overall number of higher education institutions is increasing.

12. There will be two main consequences, one concerned with the long-term health of the science base, and the other concerning the quality of educational experience for students.

The effect on research

13. Although there may be short-term gains in concentrating all research in a few hands, in the longer term, the science base will suffer. The system will tend to ossify, with the established agendas of the research giants becoming fixed; there will be little or no possibility of funding novel ideas falling outside the orthodoxy.

14. The Government has chosen to compare the research system with football, describing a scheme to attract good researchers by paying them more as a hunt for "the David Beckhams of science"[1]. Leaving aside the fact that Beckham is paid more for each 90-minute football match than a university researcher earns in a year, the analogy had some merit.

15. Beckham had his first professional games in 1994, with Preston North End Football Club, then in the third division of the Football League. Similarly, Les Ferdinand, who played for Queen's Park Rangers, then Newcastle, then Tottenham Hotspurs, began his career with the non-league team Hayes. These lower-ranking clubs did not have the wealth of the richer clubs, but they did have the basic resources to allow the future stars to practice their profession.

16. Just as the Premier League in football depends on the lower divisions for new talent, so the research league depends not only on the departments that have already proved themselves to be internationally excellent, but also on those that have the basic resources to allow people to develop, and which may have the potential to be promoted into the research premier league.

17. For this reason, mechanisms for allocating public resources for research need to be allocated selectively, but the degree of selectivity needs to allow for groups with potential as well as groups that are already excellent.

The effect on teaching

18. If research is concentrated into a handful of institutions, it will no longer be possible for many, if not most, students to study science in a research department. It may not be possible for them to study science at all, and there are already large parts of the country that where it is no longer possible to study physics.[2]

19. But even if it proved possible for many institutions to maintain teaching departments in which no research took place, there would still be a problem. It is not possible to learn science without doing serious practical work, which requires appropriate infrastructure. Final year honours projects rely on the availability of active researchers to supervise them, and on the availability of suitable equipment. If research becomes highly concentrated, a large proportion of students will not be taught in an atmosphere of discovery, and will not be familiar with research techniques.

20. Scientific industry, such as the pharmaceutical industry, relies on a supply of well-trained scientists who are not going to be the next Einstein, but who do need proper research training. This workforce cannot be delivered if most universities simply do not undertake scientific research at a significant level.

The implications for university science teaching of changes in the subject weightings

21. The changes in weightings are an unmitigated disaster. There was no justification for them at all, and they are contrary to the government's stated policy of making the UK one of the best places in the world to do science. Decision-makers at HEFCE should acknowledge that they have made a mistake, and should correct the weightings to reflect some kind of reality.

22. The current situation is that, even when student recruitment is buoyant, teaching many science subjects is not now viable without the back-up of substantial research funding, as the case of chemistry at Exeter shows very starkly. This is not the situation for classroom-based subjects such as law, English literature or business studies, where there are many departments that continue to prosper despite having very little or no research funding.

23. With a limited total quantum of money available, and in the certainty that there will never be sufficient resources available to meet all demands, HEFCE has essentially two courses of action available to it.

24. The first is to distribute the pain equally among subjects, so that there is a level playing field among disciplines with no inherent bias in favour of or against any one subject or set of subjects. No hard data exist to say what the relevant ratios would be under this system, which is itself a fault on the part of HEFCE. However, the old weightings (under which students in laboratory-based subjects were funded at twice the level of those in library-based subjects) clearly gave a closer approximation than the current ratios.

25. The second potential model would be to weight funding in favour of subjects of national importance, judged according to the needs of the economy, likely shortages, the desirability of maintaining a presence in a variety of fields, and so on. Under this model, science and engineering subjects would, on average, fair substantially better than other disciplines, as would some languages and vocational degrees.

26. Although there is a clear argument for taxpayers' money being disproportionately focused on subjects of national importance, SBS would not currently advocate this policy.

27. We do not believe science and engineering should be subject to special pleading, but that they should be funded on a level playing field with other disciplines. The recent changes have tipped the balance against science and engineering, with no justification and no obvious benefit.

The importance of maintaining regional capacity

28. Partly because of changes in the funding model, undergraduate students increasingly need to live with their families while studying. Many are likely to graduate with substantial debts, and the financial saving of living at home makes the difference between being able to go to university or not doing so.

29. For this reason, it is matter of fair access that provision should be made across the whole country for students to study important subjects, including (but not exclusively) science and engineering.

The extent to which Government should intervene

30. Although the Government chooses to assert that universities are independent bodies and that it has no power to intervene in their affairs, it is patently nonsense that when taxpayers' money is being distributed on an annual basis, the executive branch of government is somehow powerless to exert strong influence on Vice Chancellors and others.

31. That ministers know this to be the case was made clear when a former Secretary of State referred to his "letter of direction" to the Higher Education Funding Council. When the Council's chief executive pointed out that the letter was, in fact, officially called a "letter of guidance," the minister was unrepentant[3].

32. It is generally accepted that one of the jobs of Government is to intervene to correct failures in the market. It is a bizarre view that Government should not intervene to ensure the continuing provision of subjects of strategic importance. The Government's current attitude appears to be that the future of the nation's economy should be harmed by the foolish cutting of funding for excellent research and a bizarre tipping of the balance against science, or else that future prosperity should be left to the whim of the current cohort of 17-year olds, who are not choosing to study science in adequate numbers.

33. The mechanisms by which the Government could intervene could be relatively simple. It could give the Regional Development Agencies modest funding and specific responsibility for ensuring that each region maintains a competitive capacity across a broad range of disciplines. It could give the Research Councils modest extra funding and specific responsibility for ensuring that no area of research was completely lost without a breathing space to assess whether the costs of doing so would outweigh the financial savings.

34. We hesitate to suggest that HEFCE be given further authority, since it is at least as much to blame for the current predicament as any other organisation, but in fact, it has already been given new responsibilities in the Government's ten-year framework for science. Sadly, it appears not really to understand the problem, as it proved when its representative said in the press that any financial would be only be available to departments rated 5 or 5* in the last Research

Assessment Exercise[4]. While the overwhelming majority of research departments are underfunded, it is not the top-rated departments that are currently under greatest pressure. If strategic support cannot be extended to departments that are rated as "nationally excellent," it is a nonsense.

January 2005

Notes and References

[1] Daily Telegraph, 7 July, 2000

[2] *Physics – building a flourishing future,* Report of the Inquiry into Undergraduate Physics, Institute of Physics, 2001

[3] quoted in *The Guardian,* Education Section, 5 December 2000.

[4] *Times Higher Education Supplement,* 26 November, 2004