

BIOSCIENCES FEDERATION

Science Policy: UK

Report on science and education policy December 2004



THE SCIENCE Minister announced that the extra £120 million in 2005/6 and the previously announced £200 million pounds per year from 2007/8 would enable the Research Councils to pay 80% of the full economic cost of projects after September 2005, rather than the 60-70% previously estimated.

The government aim is that this will reach 100% by the start of the next decade, taking into account capital funding streams. The Minister also announced that Research Councils would pay 100% of the costs of any equipment over £50,000 per grant, with universities contributing 20% of the costs for equipment costing less than £50,000. The government anticipates that these increases, together with the promised 6% a year increase in Funding Council block grants in England, will allow QR funds to be used more to support blue-skies research and enable universities to reach full economic costs from charities and other research funders (*DTI* press release, 6/1). Save British Science welcomed in particular the tone of the announcement, which seemed to imply that there would be no strings attached to the increased funding and that university researchers and administrators would be trusted rather more than in the past. *"This can only be good for science and engineering, if it translates into less micro-management from the centre"* (Press release, 6/1).

The Director General of the Research Councils said that the new performance management system for the Research Councils would not increase the existing burden of data collection on researchers, and that there would be no attempt to shape institutional behaviour in the way that the RAE has done.

He argued that the science base has to be healthy enough to attract future generations of researchers, and to be flexible and exploitable for public good and economic objectives. *Res Ft* (8/12) considered that, ultimately, the system has been designed to facilitate strategic decision-making now required by the government. The Director General commented that it would enable the Office of Science and Technology and Research Councils to look at long term options rather than being preoccupied with allocating relatively small pockets of money in any Spending Review period. An editorial in the same issue of *Res Ft* noted that Labour's more strategic approach to research policy means that the Haldane principle of scientists deciding what science to fund is continually being eroded. *Res Ft* (8/12) also added that the decision by the Chancellor to establish a high level forum of business leaders, scientists and ministers will result in the government having two top-level committees on science, since the Council for Science and Technology already advises the Prime Minister.

An article in *Guardian Higher* (7/12), based on a survey of heads of chemistry departments, looked again at the problems facing physical science provision. All the heads of department said that the funding council unit of teaching resource is insufficient to cover the full costs of providing science courses, and nearly all were taking stock of the future. Some universities have abandoned chemistry as a separate subject, and incorporated it into user disciplines in the biological sciences. Dundee, for example, has decided to close physical and inorganic chemistry to focus instead on the more popular pharmaceutical chemistry

course (*THES*, 10/12). John Holman, head of the new National Science Learning Centre, noted that the lack of popularity of chemistry is not unique to the UK – the number studying physical sciences is falling across Europe, the US and Japan. Only in China and India is there healthy competition for places. He thought the problem is to do with the general perception by society that chemistry and the way it is taught are dull and irrelevant. Holman referred to the need to *"restore some of the bangs and surprises into school lessons steamrollered by the national curriculum and too much assessment"*. He considered engaging with

pressure to achieve 5 or 5* RAE grades reduced the effort spent on teaching. The Royal Society of Chemistry and the Department for Education and Skills will be putting together a panel early in 2005 to consider the issues. *Res Ft* (8/12) noted that the letter from the then Education Minister, Charles Clarke, to HEFCE also asked for advice on supporting research collaboration between higher education institutions, as is being pioneered in Scotland, involving universities in regional strategies, and possible variations to the 3 year honours degree model. An article in *THES* (10/12) by the Chief Executive of HEFCE concluded that there is no



11 to 13 year-olds to be essential, and encouraged more university outreach into schools.

Another article in the same issue of *Guardian Higher* blamed the decrease in funding of 4-rated research for many of the difficulties: for many departments it reduced the possibility of subsidising teaching from research income; it concentrated research in a small number of universities and hence reduced the possibility of research-informed teaching; and the

one-size-fits-all solution when subjects hitherto regarded as core disciplines fall from fashion. He considered that more needs to be done with schools to stimulate demand, while recognising that adequate provision at a national level does not always imply sufficiency at a regional level. *"We cannot alter teaching funding to cater for the needs of those who shout loudest; if the problem is on the demand side then this must be dealt with by mand-side solutions."* ▣

A consortium from the chemistry community has, in fact, secured almost £1 million from HEFCE's Aimhigher National Activity initiative, to deliver outreach activities to motivate school students to take undergraduate courses in chemical sciences. Chemistry: The Next Generation is running as a two-year pilot in the North West, the East Midlands, and London, but it is intended that the scheme will be rolled out nationally (*THES*, 7/1).

A survey by the Universities Companies Association showed that total licensing income of UK universities in 2003 increased nearly 40% to £31.3 million, but there is still some way to go to match US universities, which achieved more than £680 million. At 151, the number of new UK spin-off companies remained about the same as in 2002. The 2004 figure is expected to be lower because of the unintended adverse effect of the 2003 Finance Act (*THES*, 10/12). An editorial in the same issue of *THES* considered that a year after the Lambert review of business-university interaction, little has changed to facilitate "third-stream" activities in universities. Lambert "muddied the waters" by calling for changes to the RAE to reward more applied work. Higher Education needs a funding stream for business interaction on a par with the RAE rather than the latter becoming "an afterthought in an exercise with different objectives".

Government statistics for 2003 show that business spending on R&D in the UK is largely stagnant. It represented 1.2% of GDP, as it has since 1996. The number of industry scientists and engineers decreased 2% from 2002, and there was a worrying 11% drop in technician numbers (*Res Ft*,

8/12). Anne Campbell MP is to bring a Private Members Bill during the current parliament that requires government departments and agencies to spend 2.5% of their R&D budgets with small businesses. Similar legislation in the US has successfully fostered new science-based start-up companies. The 2001 Small Business Research Initiative in the UK has been less successful, partly because participation is not mandatory for government departments and few have chosen to participate. The current procurement processes are also too time-consuming and bureaucratic for the Initiative to work effectively (*Res Ft*, 8/12).

The Environment Secretary admitted that the UK is not on target to meet the government's manifesto target of cutting carbon dioxide emissions by 20% by 2010. She indicated that industry could face much tougher curbs on such emissions under a third-term Labour government (*FT*, 8/12; *Gdn*, 9/12). A review by the Office of Science and Technology concluded that the Agricultural and Environmental Biotechnology Commission has "ultimately failed" to increase public understanding of GM technology and to provide strategic advice to the government (*Res Ft*, 8/12).

Science Policy: International

A survey of leading international scientists on what they would like to see in 2005 included among its findings: open access to the US from abroad for students and scholars; to be able to get on with neuroscience research, which helps people with dyslexia and Parkinson's disease, without being harassed by animal extremists; a big budget Hollywood movie that makes scientists the new

idols of today's youth and leads to a burst of interest in careers in science; and a spell-check for English Euro-speak, together with a new dictionary, in order to work out what the Euro-words in Framework grant applications actually mean (*Nature*, 23/30/12). *THES* asked 1300 academics in 88 countries to identify the top university in their areas of expertise. Cambridge and Oxford came first and second for science and Imperial College 10th. US universities occupied 6 other places in the top 10, and Tokyo University the other. There were no European universities outside the UK in this top echelon (*Times*, *THES*, 10/12).

to the people that they serve – the public and leaders in industry – to seek support in making the case for increased government funding of science. US researchers are concerned that 9 months after the US government said it would create a powerful committee to advise it on issues related to bioterrorism, the committee has not yet been approved. It is meant to advise on the overseeing of 'dual-use' research, that could have civilian or military uses, and to write a code of conduct for scientists. Some biosecurity specialists point out that if the committee is not up and running soon, there is a real risk that the government could bypass it



An editorial in *Sci* (24/12) noted that the poor 2005 budgets for US science agencies are unlikely to be a one-off occurrence. The Bush administration budget predictions show the purchasing power of R&D investments declining over the next 5 years in all areas other than homeland security, defence and space. The decrease in NSF funding will seriously hamper efforts to improve science education at a critical time. The editorial urged scientists to reach out

and take extreme steps to regulate some types of dual-use biology (*Nature*, 18/12). In a similar vein, a paper on bioterrorism issued by the Royal Society and the Wellcome Trust in the UK urged that governments should not respond by screening publications to keep risky-looking information out of terrorists' hands. Instead, they should ask scientific societies and funding institutions to take more responsibility for vetting and preventing the dissemination

of risky technical details. The paper arose from a meeting of 66 experts in October, who considered strongly that censoring basic research would not prevent terrorist attacks. Wellcome Trust Director Mark Walport summarised: “*Self-governance by the scientific community, rather than new legislation, is the way forward*” (*Sci*, 17/12).

An article on academic careers in the US considered that although dozens of universities have changed their policies to provide time out from tenure-track positions to start families, created part-time tenure opportunities, and generally spread the message about the

policy, that requests authors to submit a copy of their peer-reviewed papers to the NIH for subsequent placement on PubMed Central, would harm academic publishing. The investigators and their publishers would be left to make the decision as to whether to submit a copy – it was not mandatory; there would be a six-month window before open publication; and scientists and libraries were unlikely to access the scientific literature through PubMed Central rather than by subscribing to journals because they would miss so much of a particular journal’s content by doing so (*Sci*, 10/12).

The European Union

projects, and that there should be a real attempt to reduce bureaucracy and to provide applicants with more support, guidance and feedback. There was a strong case for increasing the overall FP budget, while the funding for basic research should increase from 10-15% of the total to 15-20%. The concept of an independent European Research Council was approved (*Res Ft*, 8/12). The EC’s annual report on EU competitiveness said that policies that encourage public-private collaboration, and more generous tax subsidies, are needed to lift levels of business R&D spend. The report concluded that the EU is less successful than the US at developing such collaborations (*Res Ft*, 8/12).

Higher and Secondary Education

The 2003 Trends in Maths and Science Study found Asian school students doing very well, with Singapore, Chinese Taipei and Hong Kong being in the top 4 at both grade 4 and grade 8 stages of education. More than 360,000 students participated, taking tests designed to assess both knowledge and understanding of maths and science. English pupils ranked 5th in science at grade 4, but were outside the top 10 at grade 8 (*Sci*, 24/12). A long article in *THES* (17/12) considered the effects of a fall in numbers taking science degrees on the future supply of school teachers. Science Ambassador schemes, where undergraduates teach in schools, were considered helpful in encouraging more pupils to take science at university and the Ambassadors to consider teaching as a career.

The Privy Council has awarded a Royal Charter to the Association for Science Education that will allow it to grant charter status to experienced science teachers

who demonstrate a commitment to professional development. It is hoped that this will lead to greater prestige for the profession, improve recruitment and retention, and ultimately be linked to higher pay. The number of graduates starting science PGCEs fell last year to 2,484, well below the government target of 2,879. Details of the requirements for gaining charter status will be published in the Spring (*TES*, 7/1). At the start of the ASE annual meeting, Mike Tomlinson, former Chief Inspector of Schools, who is ASE’s new President, reiterated John Holman’s point about the need to put back creativity and a bit of risk-taking into school science teaching. All students, but particularly girls, are put off science by an overcrowded and boring curriculum, and because they think the subject is not relevant. A special science supplement in *TES* (7/1), to coincide with the ASE meeting, included items on:

- The role of the new Science Learning Centres;
- Interviews with the winners of this year’s AstraZeneca/ TES primary science teacher awards;
- Interviews with the winners of the four Salters’ Institute chemistry teaching awards;
- The Nuffield bursaries that offer first-year post-16 science students an opportunity to sample research in higher education institutions;
- An account of the new Salters-Nuffield Advanced Biology course;
- The need for a revival of field work.



need to make room for family choices, these are eclipsed by cultural norms that put a premium on productivity, especially at the start of an academic career. Researchers who surveyed women faculty members around the country referred to a ‘fear factor’ that a tenure extension could harm a career, and that women using such policies were somehow asking for special treatment (*Sci*, 17/12). The NIH Director explained in a Policy Forum article why he did not think that the new

Competitiveness Council failed to endorse the proposal to set up a European Research Council. Italy and Poland were unhappy about particular aspects. Countries backing the plan said the outcome was a delay rather than a disaster, the disagreements were technical rather than fundamental (*Sci*, 3/12; *Res Ft*, 8/12). The UK government called in a position paper for a thorough overhaul of Framework Programmes. It recommended that FP7 should pay the full economic costs of