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A Nobel stance

U.K. RESEARCH FUNDING

Universities Raise Their Game, But the Money Doesn't Flow

NORWICH, U.K.—British researchers won warm praise last week for their talent, but it came with a splash of fiscal cold water.

Reporting on a mammoth review carried out every 5 years or so to allocate funding for research infrastructure, Howard Newby, head of the Higher Education Funding Council for England (HEFCE), beamed that the U.K.'s researchers are "performing better than any [country's] in the world at the present time." Unfortunately, these hardworking researchers have raised the level of their game so fast that they have stripped bare the government fund designed to support them.

HEFCE and its sister councils in the rest of the U.K. use a formula based on the results of the Research Assessment Exercise (RAE) to distribute $2 billion of research infrastructure funds—paying for computers, libraries, and staff, for example—each year. The hugely improved results mean that they are $290 million short in the financial year that begins in August. On 14 December HEFCE's board voted unanimously to respect the RAE results but to tinker with the funding formula to funnel scarce resources to those departments with the highest rating.

The rich-getting-richer approach rankles officials at middle-ranking universities, where science departments appear to have struggled in vain. "[This] throws into question the whole incentive system that was here previously in the RAE, that if you did better you got more money," says Ben Martin, head of the Science Policy Research Unit at the University of Sussex. "I think once you move outside the top few, discontent with the whole system may be quite substantial."

Star performer. With its 30 top-rated departments, Cambridge University's funding is safe.

Begun in 1986, the review this year enlisted 60 expert panels to assess the best four recent papers from 50,000 U.K. academics. Other indicators, such as invitations to international conferences, journal editorships, and lab visits from well-known researchers, were also considered. The 17-member medicine panel alone faced 14,000 individual items over 5 months. "It was certainly quite a busy period over the summer," says panel chair Leszek Borysiewicz, an immunologist at London's Imperial College. Nearly 300 international experts were called upon to double-check the top rankings, which are meant to compare departments, not individuals, says John Rogers, RAE manager. "97% of the people we asked confirmed that the panels had got it right," he says.

Each department is scored on a seven-point scale, with the coveted 5 and 5* representing international excellence and a 4 going to departments whose work is virtually all deemed of national excellence. Levels of 3a, 3b, and below are assigned to departments with less stellar track records. Under the existing formula, the funding councils' infrastructure funds kick in for departments that achieve a grade of 3b or higher. The higher echelons receive disproportionately more: A 5* wins 4.05 times as much funding per capita as a 3b department.

The latest RAE results, which include humanities and social sciences, show a huge improvement, with several institutions showing dramatic gains in the last 5 years across a spectrum of subjects (see table). For example, the University of Manchester increased its number of 5 and 5* departments from 28 to 37. But at least one high-profile institution has seen its star dislodged: The University of Oxford was toppled from the number one spot by archrival University of Cambridge, slipping to number three behind Imperial College. Altogether, 55% of researchers now work in departments of international standing, compared with 31% just 5 years ago. "There's absolutely no doubt that the quality of the work that was submitted to us has gone up," says Bristol University's John Enderby, who headed the physics panel.

To probe for any bias in the assessment, HEFCE asked Evidence, a consulting firm in Leeds, to check the results using citation analysis. "The citation analyses show that the

OVERALL EXCELLENCE

Institution by rank	1996 position	Weighted average score
1) University of Cambridge	(2)	6.69
2) Imperial College	(4)	6.68
3) University of Oxford	(1)	6.58
4) London School of Economics	(3)	6.46
5) Institute of Cancer Research	–	6.25
6) University of Warwick	(8)	6.20
7) University College London	(5)	6.19
8) Cardiff University	(15)	6.11
9) University of Manchester	(23)	6.09
10) University of Essex	(11)	6.05
11) University of Southampton	(20)	6.03
12) University of Durham	(18)	6.00
13) London School of Hygiene and Tropical Medicine	–	6.00
14) Lancaster University	(9)	5.99
15) University of Sheffield	(19)	5.97

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U.K.'s average performance has improved," says Evidence chief Jonathan Adams. Britain's average number of citations per paper has increased from 23% above the world average to 38% since the last RAE. "It's a pretty stunning performance," says Adams.

HEFCE officials view the improvement in research quality as a validation of their approach of channeling more money into strong departments. "This is actually selectivity at work. We gave more money last time to those that were 5 and 5*. And what did they do with it? They invested it in more staff," says Bahram Bekhradnia, HEFCE's director of policy. Newby says there is anecdotal evidence of large staff turnovers in the past 5 years in which high-caliber researchers tended to replace underperforming staff members. Indeed, says Bekhradnia, "there's been a lot of evidence of deliberate policies to bring in new blood."

Sadly, many university departments whose improvements are not enough to place them in the upper echelon will find the RAE an exercise in frustration. The government has ruled out any extra cash for the funding councils to maintain current funding levels while also rewarding those departments that have improved their rating. Faced with the cash crunch, the HEFCE board has "committed ourselves to funding 5*'s: They will get the full amount," says Newby. But the simple solution—putting 3a and 3b departments into the pool that won't receive funding—would not erase the shortfall. The HEFCE board meets again on 23 January to decide on a final formula.

Skewing the funding even further toward the top-rated institutions is likely to provoke a furor in some departments. Research funding is already very selective, says Roderick Floud, president of Universities UK, an umbrella organization representing all of the U.K.'s universities. "It should not be made more selective," he says. Enderby says he would welcome a "flatter" funding model: "Small centers of excellence must not be squashed out."

"There is always a dilemma ... about research funding, about whether one puts all the resources toward the most excellent alone, or whether one holds some money back to fund research capability in areas which are not currently very strong but which have the potential to get stronger in the future," says Newby. As with most dilemmas, it's easier to describe than to resolve.

–ANDREW WATSON

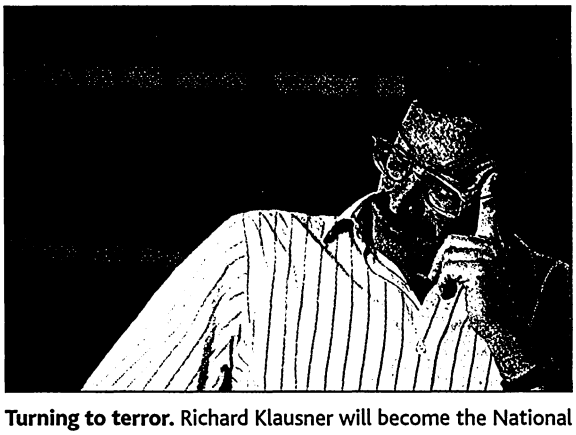
Andrew Watson is a writer in Norwich, U.K.

CREDIT: SAM KITTNER

BIOMEDICAL RESEARCH

Case Institute a False Start

Ten weeks after leaving the top job at the $4 billion National Cancer Institute (NCI) to start a new biomedical research institute, biologist Richard Klausner has jumped again, this time to help the government combat terrorism. He will serve as a liaison between the U.S. National Academies and the government's antiterrorism efforts while maintaining a lab at NCI. Klausner's surprise move means that the $100 million organization he was supposed to lead has folded before it even began.



Turning to terror. Richard Klausner will become the National Academies' point person on antiterrorism.

Klausner announced his departure from NCI on the morning of 11 September, just as the planes crashed into the World Trade Center and the Pentagon (*Science*, 14 September, p. 1967). He said he had a commitment from Jean Case and her husband, America Online founder Steve Case, to fund the Case Institute of Health, Science and Technology, with him at the helm. In October, he told *Science* that the Cases had agreed to spend nearly $100 million over the next few years on bioinformatics studies and other life sciences research, including awarding grants to outside researchers and hiring an in-house science team.

Those plans were shelved earlier this month, Klausner says, after his volunteer work as the co-chair of a new National Academies panel on antiterrorism began to take the lion's share of his time and interest. "The Cases and I felt that launching something new from scratch wasn't doable" given his time commitment to antiterrorism efforts, he says. "The nation's interests come first, and we fully support [Klausner's] decision," says Jean Case.

Klausner, who says that his new position "is a calling," estimates that it will take up half his time for at least a year, leaving him an opportunity to continue running his NCI laboratory. National Academy of Sciences president Bruce Alberts says Klausner will be responsible for keeping an eye on the academies' many studies on terrorism-related subjects, helping fulfill government requests for immediate technical assistance, and sharing potentially useful ideas with the White House Office of Science and Technology Policy (OSTP). OSTP head John Marburger says Klausner's knowledge of Washington will make him "a very effective interface" between science and government.

Jean Case says there are "no plans to revisit" the idea of creating the institute. Klausner's two assistants have shifted to other work within the larger Case Foundation, which supports a variety of education and technology programs.

–DAVID MALAKOFF

With reporting by Eliot Marshall.

PARTICLE PHYSICS

Sign of Supersymmetry Fades Away

Like that extra $223.78 that seemed to enrich your checking account before you realized your mistake, a tantalizing hint of new elementary particles has vanished once physicists double-checked their math. The culprit: an extra minus sign in one of the calculations.

In February, researchers at Brookhaven National Laboratory in Upton, New York, reported that a particle called the muon was 4 billionths more magnetic than predicted by the Standard Model of Particle Physics (*Science*, 9 February, p. 958). The muon's magnetism depends on other particles that flit in and out of existence too quickly to be directly observed, so the tiny discrepancy between the measured and predicted values suggested the presence of new, unaccounted-for particles. Many physicists interpreted the result as possible evidence of supersymmetry, a theory that