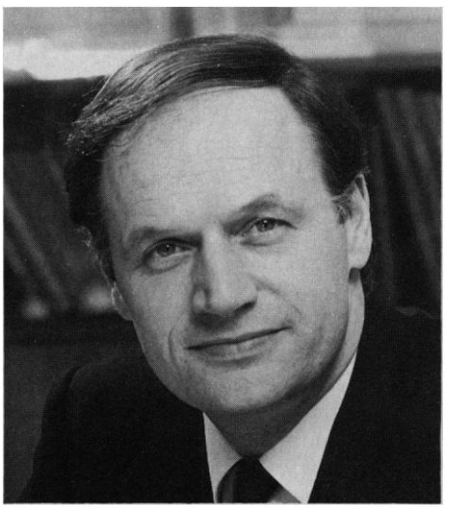
U.K. Science: Survival of the Fittest—or Fattest?

The British government claims its budget restrictions will increase the effectiveness of university research; critics say too much selectivity could kill the goose that lays the golden egg



George Walden. *"Universities will have to justify much more than in the past the intellectual value of what they are doing."*

London

FOR the past 7 years, Britain's scientific community has been learning to live with zero-growth budgets, watching despondently as the research spending of most of the nation's international competitors has risen significantly. The resulting pressures have prompted a running battle between the government and scientists, who claim that the nation's research capability has been diminished in almost every field of science, sacrificed to a blind commitment to reduced public spending.

Beneath the debate about financial support, however, lies a deeper conflict over the future of university-based research. Through both choice and necessity, the cuts are resulting in significant structural changes in the way that British science is organized. A central element is the increasing concentration of research funds on a restricted number of university departments, and thus a gradual move away from the idea that all academic researchers should have the opportunity to carry out research at the forefront of their discipline.

The Conservative government argues that a greater concentration of resources is highly desirable—even if it means that some universities eventually become little more than undergraduate teaching institutions. Prime Minister Margaret Thatcher has recently made it clear that she considers financial stringency a means of imposing greater discipline—as well as accountability—on the research community. "It will encourage good science by concentrating resources where they are most productive," she said in a letter to Labour Party leader Neil Kinnock last month.

The government's critics say this is little more than a smoke screen. The government's only real concern, they say, has been to cut public spending, with little concern either for the strategic research planning needed to ensure the country's long-term technological strength, or for the fact that its policies are leading to basic research being concentrated in a dangerously narrow band of institutions.

"Of course you have to have selectivity, but the first thing you have to do is to decide what you want to do, and at what level," says physicist John Mulvey at the University of Oxford, one of the founders of the Save British Science campaign, which now claims 2500 paid-up members. "The government is trying to do things backwards."

The roots of the current conflict reach back to the mid-1960s when the Labour government of the day, acting on the recommendations of the economist Lord Robbins, agreed on a major expansion of the university system. The prime aim was to increase significantly the number of students entering universities, but the philosophy on which the expansion was based was that all university teachers should, in principle, remain actively involved in research.

The post-Robbins expansion was grafted onto a system in which universities have remained the major focus of Britain's basic research. (In contrast, Britain's European neighbors have created separate networks of scientific institutions, such as France's National Center for Scientific Research and West Germany's Max Planck Society.) Under the so-called "dual support" system, a university's government grant, allocated by the University Grants Committee (UGC) primarily on the basis of student numbers, covers the basic costs of its research infrastructure, while money for specific projects is provided by the separately financed research councils and other sources.

In principle, the dual-support system has placed all universities on an equal footing, at least in terms of the opportunity to attract outside research funds and therefore permit scientific talent to flourish. In practice, growing financial pressures on the UGC have, over the past 15 years, undermined the effectiveness of the system, while new universities trying to pull their research up by its bootstraps have found themselves confronting a system that still remains largely dominated by traditional institutions.

More than half the $420 million in research grants awarded to university scientists last year by the Science and Engineering Council, for example, went to 12 out of a total of 75 institutions. The top five alone—Imperial College (London), Oxford, Cambridge, Edinburgh, and Manchester—account for more than 30%.

The picture is almost identical for postgraduate research studentships—perhaps a better measure of the overall distribution of talent, since research grants tend to be bigger in fields that use more expensive equipment. Here again the top three, in descending order, Cambridge, Oxford, and Imperial College, took 20% of the studentships, and the top ten (the others were Manchester, Nottingham, Edinburgh, Leeds, Southampton, University of Manchester Institute of Science and Technology, and Bristol) accounted for 40%.

Critics of the government's policies do not contest that this is a realistic reflection of the distribution of scientific achievement in Britain. But they argue that, after 20 years of sustained effort to break the traditional patterns of dominance by a relatively small, elite group of institutions, the recent government policies have reinforced this dominance to the detriment of the scientific talent existing in less privileged universities.

"Concentration is fine, and forcing people to work together is fine," says biochemist Hans Kornberg, professor of biochemistry at the University of Cambridge. "But if you look back and ask which are the seminal ideas that have really changed the ideas of scientists, such as restriction enzymes or superconductivity, each came from an individual working almost independently. The birth of a new scientific idea is like the birth of a baby—what one woman can do in 9 months cannot be done by nine women in 1 month."

The pressures to concentrate research on institutions that are already the most successful have been growing steadily. Last year, for the first time since it was founded in 1919, the UGC announced, under pressure from the government, that it was including an assessment of the quality of a university's research in decisions about the size of its annual grant. This assessment involved a controversial exercise in which the research activities of all university departments were judged as "outstanding, above average, average, or below average" in their particular discipline.

The process is likely to be taken considerably further under the new scheme for financing universities, unveiled by the British government 2 weeks ago in a White Paper on higher education. The UGC will be replaced by a University Finance Council, in which money will be allocated to universities on a contract basis only after they have demonstrated what they intend to do with it.

Little has yet been said about the details of how this will affect the funding of research. However, the government has announced that one of its principal intentions is to achieve the "better targeting of research work." And it is generally accepted that this will mean concentrating research funds in a reduced number of university departments, and that these departments will be required to compete with each other for the limited resources being made available.

"Universities will have to justify much more than in the past the intellectual value of what they are doing compared to what is happening in the other universities in Britain," says George Walden, the minister responsible for science and higher education in the Department of Education and Science. "There is going to be more selectivity, and a greater directional flavor. We are not going to make the choices ourselves; those must be made by the scientific community. But we are determined to make sure that the choices are made."

Many university administrators agree with the government that increased concentration in the allocation of research funds is now inevitable. In some cases there is a clear logic, for example when several university departments share large equipment. "One of the major problems facing us at the moment is that scientific research has become so expensive that not all universities can hope to have available the sophisticated equipment they would like," says Michael Powell, secretary of the academic affairs subcommittee of the Committee of Vice-Chancellors and Principals.

Others are already talking about the possibility of developing closer collaboration between universities on a regional basis. Universities in major urban centers such as Manchester or Birmingham could pool some of their academic and scientific resources more broadly than in the past, for example.

The major disagreements with the government are, first, whether an excessive amount of selectivity is already depriving less recognized but nevertheless potentially productive research groups of funds; and second, whether the government will be tempted to take all significant research responsibilities away from some universities, thus breaking the teaching-research relationship that still remains the basic philosophy of the whole university system.

There have already been cries of anguish from university research departments that suddenly find themselves about to be axed, as individual institutions try to apportion reduced grants from the UGC. At the University College, Cardiff, for example, the microbiology department is one of six to be closed in the interests of economy.

"We need some institutions which are analogous to Harvard and Yale, and others which are more like the liberal arts colleges," says David Phillips of Oxford University.

"Biotechnology is the fastest growing industry in South Wales," says department member Richard Allman in a recent letter to the journal *New Scientist*. He points out that the department has a higher rate of production of scientific papers than any other at the college, and that last year there were 150 applicants for 25 places offered on a single honors degree course. "It seems totally ridiculous not to have a center of excellence where it is really required."

The UGC itself has become reconciled to the fact that individual universities—and not only those that come out low on the ratings exercise—are having to decide, for the first time since the Robbins expansion of the 1960s, on where to cut their scientific activities. (Even Oxford is likely to abolish 140 posts, while Cambridge is contemplating closing its department of applied biology.) However, the UGC does not see eye-to-eye with the government over proposals that there should be a new, vertical stratification of universities, in which some would become identified as "research universities," while others would concentrate on undergraduate teaching.

David Phillips, professor of biophysics at the University of Oxford and chairman of the government's Advisory Board for the Research Councils, says he sees little wrong in this approach. "We need some institutions which are analogous to Harvard and Yale, and others which are more like the liberal arts colleges," he says. "If you compare the population of Britain with that of a state such as California or New York, then I would have thought that if one was aiming at 20 institutions [focusing on postgraduate teaching and research], one would be doing very generously."

Others have argued that the elite group of universities should be as small as 12. But any suggestion that institutions not selected for privileged treatment should no longer be considered as mainstream research universities has been strongly attacked by those who argue that teaching and research should remain inseparable. "If you remove a research capacity from universities, they are no longer what we regard as universities," says Powell of the vice chancellors' committee.

Walden strongly defends both the government's track record and its plans for the future. Implicitly accepting the continued dominance of traditional centers of learning, he argues that allowing smaller universities to pool their scientific resources will enable them to become more effective competitors, and will thus ensure, at a minimum, that the larger institutions "are kept on their toes."

Similarly, while not explicitly endorsing the idea of "teaching universities," Walden says it would be "almost unscientific" to dismiss the possibility of diversity. "It seems odd to suggest that every institution has to conform to a single pattern."

Those who have talked privately to Walden say he is personally more sympathetic to the dilemma facing the universities than his combative public statements frequently make him appear, particularly to spending cuts demanded by the Treasury that have reduced the real value of the government grant to universities by 13% over the past 4 years.

Nevertheless, the steady exodus of scientists leaving Britain for greener pastures—particularly in the United States—is only one illustration of the depths to which morale has fallen. "Even those departments which, by the government's own standards, produce top-rate science are having to make do with a 'string and sealing-wax' approach," says one scientist. "That is a problem which no amount of selectivity is going to solve." ■ **DAVID DICKSON**