the report's promised release and with a new letter outlining NBS's position, the scientists on the HHS panel reversed themselves again, and stated once more that resettlement would pose "minimal health risk."

David Rall, director of the National Institute of Environmental Health Sciences and a member of the HHS panel, says that "we had two choices: we could agree with the resolution of the issue or start an entirely new review of the data. In the best of all worlds it would have been nice to have another 2 months to go back and look at this. But we relied on the statements of several of our panel members, who had been at the meeting with EPA and NBS, that the questions [about the data] were being resolved." Brandt agrees. "We were not under any pressures from EPA that I am aware of," he says. The only apparent pressures came from the residents of Niagara Falls and their elected representatives, who repeatedly pressed for the report's release, both officials say.

In retrospect, Brandt thinks that HHS might have avoided the embarrassing reversals of opinion by directly assessing the data's validity—rather than relying on the assessment by NBS. This would have avoided the appearance of undue last-minute NBS and EPA influence on the HHS conclusions. Alternatively, HHS might simply have waited until the NBS review was complete and the EPA report was in final form, before issuing its own conclusions.

The tendency in Congress is to view such last-minute shifts as evidence of connivance among the agencies to develop the least alarming conclusion about the canal. The evidence is entirely circumstantial, however, and could just as easily represent a reasonable attempt to develop a useful recommendation under difficult circumstances. Given the statements of HHS officials and scientists that unsavory pressures were not brought to bear, the evidence tilts in favor of an honest approach.

The irony is that without the congressional pressure for publication of the report in July, HHS and NBS would undoubtedly have reevaluated the final EPA report on Love Canal more carefully. The reason that some congressmen may be confused about the report is that they helped bring the confusion about.

—R. JEFFREY SMITH

British Universities in Turmoil

Already reeling from sweeping budget cuts, they now face the prospect of increased central control over research policy

London. Early in July, Britain's Secretary of State for Education and Science sent a tremor through the nation's universities by hinting that the government might soon take a much more direct role in determining their teaching and research programs.

Secretary Keith Joseph's remarks, expressed with a certain British understatement, potentially represent the most significant shift in British higher education policy since the massive expansion of the 1960's. Joseph's views must be seen against a background of broad cuts in government support of the universities, with thinly veiled threats of further action if they do not go along with government policy.

In the past, British universities have fiercely guarded their internal decision-making against government interference. The University Grants Committee (UGC) receives a lump sum from the British Treasury—about $1.92 billion for the 1982–1983 academic year—and distributes this to individual universities as "block grants." Each is then, in principle, free to decide how the money should be spent.

Joseph, in a letter to UGC chairman Edward Parkes, has suggested that the time may be ripe for a shift in responsibilities. The letter asks the committee for its views on priorities in specific areas of science and technology "which are, or may be of particular relevance to industry." But it also says that, because policies for the universities must take account of national needs, "it might be appropriate for Ministers to take more responsibility than they have hitherto for determining priorities affecting the broad character of the allocation of resources to universities."

This policy shift could have important implications in the long term, but the cuts in university support are already causing severe anguish. Last summer the government announced that, as part of a general package of public spending cuts, British universities would receive 15 percent less money in real terms in 1983–1984 than they had in 1980–1981. For individual universities, the cuts ranged from 1.5 to 44 percent.

So far, the cuts have been directed at teaching rather than research. As in the United States, the science budget has been one of the few academic areas of spending to emerge almost unscathed from the public expenditure review. In particular, the Department of Education and Science's (DES) five research councils, which fund academic research, are still anticipating a budgetary increase in line with the projected rate of inflation—meaning zero growth in real terms, but not the contraction anticipated for the rest of the university system.

The problem for science, however, emerges from the unique British arrangement known as the dual support system, in which both universities and the research councils share responsibility for the health and support of university-based science.

The principle of the dual support system is that universities should, through their UGC funds, provide a basic "floor" of support for both teaching and research. Research council support is confined to the additional expenditure incurred by individual research projects, for example, for extra staff or equipment, and is only provided to universities able to demonstrate their research base is already sound. This contrasts with the U.S. approach, in which support services are paid in part from overheads on research grants.

The system worked well during the period of steady postwar expansion in both teaching and research budgets. But over the past decade it has shown increasing signs of strain as this expansion has come to a halt. Not only does static funding mean that new activities can only be started if old ones are abandoned, but the two components of the dual support system are experiencing different types of internal pressures.

The research councils in particular are becoming concerned that many universities, in deciding how to allocate the UGC-mandated cuts, are finding it less

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painful to reduce research commitments than those for teaching. Last year the independent Advisory Board for the Research Councils (ABRC) established a working party jointly with the UGC to find out how bad the situation is and what should be done about it. Chaired by ABRC's chairman Alec Merrison, vice-chancellor of the University of Bristol, the working party produced its report in June.*

The report, which argued that the dual support system is "sound in principle and should be retained," has been widely criticized within the scientific community for understating the severity of the impact of the government's cuts on university research. Merrison has also been criticized for the apparent conservatism of his suggested remedies, as the report recommends various ways in which the situation could be improved but argues that "our task is not to design a radically new structure."

DES officials associated with the report, however, argue that, if its conclusions and their implications are taken seriously, the changes would in fact be more radical than generally realized. The radicalism lies not in any dramatic structural innovations but in what appears to be an implicit shift in decision-making responsibility for research.

Indeed, if Merrison's conclusions are accepted by the government, the funding of basic scientific research would be taken increasingly out of the hands of the academic community and its liberal traditions and brought under more centralized administrative control at both the local and the national level. This, it should be noted, is in line with the suggestion made by Joseph in his letter to Parkes.

The main strategic problem facing the government, and underlying the detailed conclusions of the Merrison report, is how to ensure that expansion and contraction take place in the most appropriate parts of the university research system. The difficulty is that definitions of "appropriate" vary widely, depending on the one hand on the criteria used (such as academic excellence or industri-

**Report of a Joint Working Party on the Support of University Scientific Research* (Her Majesty's Stationery Office CMnd 8567, London, 1982). £4.35.

U.K. in Dilemma over Biotechnology

London. Despite the pioneering work of its molecular biologists, Britain's position in biotechnology has been allowed to slip "because for too long too little attention has been given to the importance of a clear science policy for the U.K.," according to a report published by a British parliamentary committee last month.

The report is based on evidence presented at a series of hearings held over the past year before the Education, Science, and Arts Committee of the House of Commons. The nine members of the committee, chaired by Labour member of Parliament Christopher Price, make a series of suggestions for ways in which the British government might help boost its biotechnology industry. The main thrust of the committee's report is to argue that the problems facing biotechnology in Britain are symptomatic of deeper dilemmas facing the British research and development system as a whole, in particular, the lack of any sense of strategic planning.

One of the principal starting points adopted by the parliamentary committee is a report published in March 1980 by a working party made up of leading members of the academic and industrial research communities. The so-called Spinks report, which took its name from the working party's chairman, Alfred Spinks, advocated a substantial increase in government commitment to biotechnology. It suggested, for example, that an investment of several million pounds be made in new university staff and equipment, and that the University Grants Committee (UGC) and the research councils, with the backing of the universities, "should support the expansion of a limited number of centers of excellence in biotechnology from the best existing in universities."

The Spinks report's recommendations did not receive a warm welcome from Prime Minister Margaret Thatcher's Conservative government. A subsequent government White Paper, which encouraged the private sector to take up the challenge of biotechnology but offered little in the way of direct support, poured cold water on the expectations that had been raised. "When witnesses were asked for their views on the government's response to Spinks, they were uniformly dismissive," says the report.

The committee itself picks up and repeats several of the themes running through the Spinks recommendations. In particular, it notes that "the lack of coordination in governmental activities in relation to biotechnology noted by Spinks seems to be but a reflection of a greater lack of coordination in the management of science policy generally."

The theme is an increasingly popular one among industrial circles in Britain. Two weeks ago, the Confederation of British Industry produced a report "Technology—putting it to work," in which not only was biotechnology identified as one of the main areas on which Britain's future prosperity depends, but the complaint was made that "Britain has no effective forum in which to generate consensus on industrial objectives."

So far, Thatcher's government has steered clear of any broad effort at selectivity in industrial policy. At the research level, however, there has been more movement. A new company, Celltech, was set up in 1980 with a mixture of public and private capital to exploit the results of biotechnology research sponsored by the Medical Research Council (MRC). The Science and Engineering Research Council has recently established a new directorate in biotechnology. And the UGC has taken the relatively unusual step of allocating extra funds to a few selected universities to boost their efforts in this area.

The House of Commons committee argues strongly for even greater movement in this direction. It criticizes the MRC/Celltech agreement on the grounds that it creates a monopoly on the exploitation of the research, suggests that the research council practice of earmarking a proportion of its funds for biotechnology should be "rapidly improved."

Despite its bipartisan composition, the committee contains some thinly veiled criticism of recent government cuts in support for universities, and their impact on research. Despite the extra money that has been allocated by the UGC, "we are still concerned that in many universities and some polytechnics the research base remains at risk and needs more resources if we are to maintain Britain's present lead in this area" said Price last week.

—DAVID DICKSON

al relevance), and on the other on the interests they are intended to serve (such as university staff or outside sponsors).

At the heart of this debate is the concept of "selectivity." The dominant postwar philosophy in British research has been that the principal criterion for supporting science should be excellence as judged by fellow scientists. In contrast, calls are increasingly being heard from both government and industry that support for basic research should be more focused on areas of potential social or industrial need.

The Science and Engineering Research Council (SERC), with its relatively centralized decision-making through subject committees, has pursued a policy of selectivity for several years. It has, for example, pinpointed polymer engineering, marine technology, and, most recently, biotechnology as some of the areas appropriate to receive special research funds.

In the past, the UGC has steered away from any such dirigisme in its efforts to be fair to all universities and all disciplines. Although funds to universities have occasionally been earmarked—again most recently for biotechnology, for which about $1.4 million was allotted to three universities earlier this year—the procedure is the exception rather than the rule.

Several members of the UGC would apparently like the committee to be more selective. The problem is not so much intention as institutional structure. "The real difference is that our mechanism is by its essence a selective mechanism" says Brian Oakley, secretary of the SERC. In contrast, the UGC operates on a "me-too" basis, he suggests, where a concession offered to one discipline must be offered to others as well.

The same dilemma occurs at the level of the individual university. The Merrison report suggests that universities establish research committees to decide how their research efforts should be most effectively distributed. "We are convinced that whatever research is done should be of high quality and properly supported, and this means that universities will need to concentrate research funds into selected areas," it says.

This would go against traditions in most universities, where priorities are set by individual departments and faculties, allocating UGC support primarily on the basis of student numbers. William Hall, professor of nuclear engineering and vice-chancellor for research at the University of Manchester, notes that all professors at Manchester are equal with no hierarchy. "It is up to the professor to decide what goes on in research. It is difficult to see how a university research committee would fit in at all."

To some observers, however, the development of more heavily centralized research administrations within universities is natural. "Universities and polytechnics must begin to develop their own research policies," says Michael Gibbons, head of the Department of Liberal Studies in Science at the University of Manchester.

Several of the newer universities have successfully operated research committees for years. John Ashworth, vice-chancellor of the University of Salford, which has been hardest hit of all by the UGC cuts with a 44 percent reduction in support over the next 3 years, says the Merrison proposals do not go far enough. To compensate for the effects of the UGC cuts, for example, Salford has recently established an organization called CAMPUS (Campaign to Promote the University of Salford) to raise funds from local industry and distribute them to university researchers.

Perhaps the greatest tensions in the research community have emerged from different approaches to an even more thorny problem, namely, how to reduce the number of tenured faculty members. Because about 70 to 75 percent of UGC support for universities goes for salaries, staff reductions have been made inevitable by last year's cuts. It is estimated that 3000 to 5000 academic jobs will be lost during the next 3 years.

Given the legal difficulties of sacking tenured staff, universities have so far chosen to achieve targets through voluntary retirement schemes. In some cases, researchers can retire when they are as young as 50. Such voluntary retirement schemes, however, can play havoc with attempts to focus university research efforts in selected areas. For example, the retirement package is considerably more attractive to those likely to encounter little difficulty in finding work elsewhere—such as engineers or biotechnologists—than to those for whom there is little outside demand.

A second effect of the current massive wave of staff cuts worries the scientific community more. This is the fact that, unless compensating actions are taken, it will be even more difficult to find positions for new young staff.

Behind the various changes contemplated in the dual support system is a growing debate over whether the idea of an essential connection between top-quality teaching and top-quality research has become a sacred cow that may have to be sacrificed to meet economic exigencies. Any moves in that direction, however, can be expected to arouse opposition from the university community, in particular from the academics' union, the Association of University Teachers (AUT), whose deputy general secretary, John Akker, argues that "unless you get teaching and research in tandem, the quality of both will inevitably suffer.

The AUT has mounted a vigorous compaign against the cuts, emphasizing in particular that the impact on research is likely to impair the future health of the nation's industrial base. "The big question is whether people see university basic research as part of the economic regeneration of this country, whether the vast amount of money which is spent on higher education in this country is looked on as an investment," rather than just a drain on the public purse, says Akker.

So far, the AUT's arguments against the cuts do not seem to have made much impression on Prime Minister Thatcher, herself a chemist and at one point Secretary of State for Education and Science in Edward Heath's Conservative government. She is said to be taking a deep interest in the restructuring of Britain's research efforts. Thatcher seems to believe that the universities will emerge leaner but fitter from their present ordeal, although some members of the Cabinet are said to have been unhappy about the way that the UGC's distribution of cuts seems to favor universities in the Oxbridge tradition and to have hit some of the newer technological universities much harder.

At present, the universities are still being given the opportunity to devise their own responses to the new environment. But DES officials see the Merrison report as outlining some of the changes which the universities must introduce if they are to remain in government favor. For example, the report suggests universities should build stronger links with industry, should develop ways of sharing expensive research equipment, and—perhaps most fundamentally—should give higher priority to research funding "at the expense of other activities," that is, of teaching.

Joseph has already suggested in his letter to Parkes that, if the universities are not prepared to change voluntarily, then a more direct solution may be thrust upon them. Such a move would be somewhat ironic for a government whose economic philosophy is, like that of President Ronald Reagan, based on nonintervention.—DAVID DICKSON