Britain: A Touch of Austerity for Research and Universities

In its campaign manifesto before the recent parliamentary elections in Britain, the Labour Party called for a program of fairly far-reaching social and economic measures. Then Prime Minister Harold Wilson and his colleagues found themselves in office as a minority government, which, like virtually all other governments in Western Europe, lacks a mandate for decisive action. The expectation is that the Labour Party will try for a working majority and greater political leverage by calling a new election perhaps in June, certainly in the autumn.

Meanwhile, the British give the visitor the impression of spending a season in limbo. The sense of suspension is reinforced by Labour's pledge to renegotiate Britain's membership in the European Community, although in recent weeks this issue has been overshadowed by the serious strains on the Community caused by Italy's unilateral declaration of stiff import controls and by the uncertainties induced by West German chancellor Willy Brandt's resignation. The British, however, seem mainly relieved that the economic and political melodrama of the energy crisis and the miners' strike have moderated, even though they are ruefully aware that they have not solved their major problems, many of which involve tough scientific and technical issues.

While a lot of major decisions are being deferred, the Wilson government is under heavy pressure to take immediate action on two matters at the top of the technical agenda—the fate of the Concorde supersonic transport and choice of a reactor type for the next nuclear power plants in Britain.

For some time the British have been rumored to be at the point of pulling out of the Concorde project—a joint effort with the French. Whatever technical achievements Concorde represents, the plane has been accounted a commercial loser. The British delay in acting is said to have been prompted by a sense of delicacy over the French political situation and no move was expected until after the runoff round of the current presidential elections in France. The rumors of British withdrawal, however, have been labeled as only speculation by the new government. Even if Concorde is an economic albatross around its neck, the government may have decided, in consideration of its French partner and its own aircraft industry, to wear it.

As for the reactor, until recently it was widely believed that the British would buy American for the first time. The Central Electricity Generating Board (CEGB), which plays the key role in making technical choices on power plants, had stated its preference for a Westinghouse light water reactor, which the British call a pressurized water reactor (PWR), and, in fact, the CEGB was said to be on the point of signing up for two 1200-megawatt PWR's. The elections apparently held things up, and then in late April the science editor of *The Financial Times*, who is well informed on British nuclear matters, reported that it was unlikely that the next British power reactor would be a British-designed steam-generating heavy water reactor (SGHWR). Some misgivings have been expressed about the safety of the American reactor, but the reported U-turn by the British government was thought to have more to do with dogged British determination to sustain a viable national nuclear industry (*Science*, 29 June 1973). The press report brought a prompt and vigorous official denial that a decision had been made, although not that a reevaluation was in progress. To confuse matters further, indications are that the choice of the SGHWR would not preclude later purchases of PWR's.

One matter about which scientists and other academics probably wish there was more uncertainty is funds for basic research and higher education. In both sectors there is no ignoring that the process has gone beyond a "leveling off" and that the squeeze is more severe than in the United States. A policy of retrenchment was adopted by the Conservative government and there have been no indications that the Labour Party intends to reverse the policy. In an inflationary world where the same means less, these budgets have been cut. And officials of the Department of Education and Science hint that the policy may be pressed further.

Late last year the universities were told that they would get only one-fifth of the funds projected for capital expenditures next year and would lose nearly half of their equipment budgets. As for operating funds, after inflation is taken into account, it appears that there will be a reduction of about 5 percent in money earmarked for salaries. With adjustments for inflation, some 26 universities are expected to have less real purchasing power than last year.

Science Losing Ground

It may have been made politically easier for any government to take this tack with the universities because the pressure of numbers has slackened. The "swing away from science"—a trend which started several years ago—resulted in an excess of places for students in science faculties. The exception is a "swing" toward medicine—medical school entries in Britain have doubled in 10 years from 2000 to 4000 annually. The trend continues and has had a spillover effect on the biological sciences. Arts enrollments have more or less stabilized, although the dynamics of the case have not really been analyzed. It is not clear, for example, what has happened to the surplus of applicants in the social and behavioral sciences who were being turned away from the universities a few years ago for lack of places. At any rate, the current 5-year budgeting plan calls for a total of some 72,000 more "student years" than will actually be spent in universities by students in that period. As a result, the University Grants Committee, Britain's central planning and disbursing organization, is now renegotiating its quinquennial budget for the first time since 1919.

The British civil R & D budget, which contains most of the funds for basic research has also been cut. The five government-funded research councils* will lose—in real terms—about 2.6 percent of a total budget amounting to nearly $350 million. The cuts come at a time when the councils are adjusting to changes in the method of research

* Agricultural Research Council, Medical Research Council, Natural Environment Research Council, Science Research Council, and Social Science Research Council.

funding, which many British scientists feared threatened the status of the councils (*Science*, 5 November 1971). As a result of recommendations by Lord Rothschild, head of a think tank in the Cabinet Office (which provides staff support for the Cabinet), control over portions of research money was transferred from the research councils to relevant ministries. More palpable, practical results from research were the objective and a "customer-contractor" nexus the method recommended.

The portion of the budget to be transferred totaled 40 percent, and this ranged from a high of 57 percent of the budget of the Agricultural Research Council to virtually nothing in the case of the Science Research Council, which funds most basic research in the physical sciences. This is the middle year of a 3-year transition period, and few traumas seem to have occurred; civil servants and professors have apparently negotiated equably.

To a visitor, the scientific community's reaction to the budget actions seems stoic. One reason may be that the cuts have not yet really been felt. But there is also a widespread acknowledgment that Britain faces a very serious economic situation symptomized by "stagflation" and balance of payments problems. There is a feeling that science and higher education enjoyed a golden era—in more than one sense—in the late 1950's and the 1960's and that lately things have been going wrong. At some universities, notably Essex and Oxford, there are unsettled and genuinely unsettling conflicts over student rights or university discipline,

Low Marks for AEC's Breeder Reactor Study

The federal Environmental Protection Agency has given a failing grade of "inadequate" to the Atomic Energy Commission's year-long, $2-million attempt to assess the environmental effects of a commercial breeder reactor technology. In a summary prefacing its 94-page critique of the AEC's draft statement, the EPA said that so much work would be required to correct all the flaws and fill all the omissions that the AEC would be well advised to ask for a delay in the 14 June deadline set by a federal appeals court for the impact statement's final version.

The National Environmental Policy Act requires federal agencies to assess the environmental and economic costs and benefits of major regulations and programs. These assessments are subject to review by the EPA and other agencies as well as by the public. The AEC's first attempt to satisfy the requirements of the law was rejected as inadequate by the appeals court last year. In March, the AEC released a draft of its second attempt, a massive five-volume tome some 2200 pages long (*Science* 29 March). In this document, as in the first, the AEC concluded that plutonium-fueled breeder reactors could supply a large portion of the nation's electric power by the year 2000, without adverse effects on the environment and with a saving of billions of dollars over the cost of other technologies.

The EPA, in its critique, said it had not tried to render a "final judgment" on these claims. At the same time, the EPA said the AEC's new statement "does not support these conclusions." The environmental agency gave the AEC report its lowest rating, a 3, signifying that the analysis was in need of "substantial revision."

In several ways, the EPA's detailed criticisms closely paralleled those of leading environmental groups, notably the Natural Resources Defense Council and the Scientists' Institute for Public Information, both of which produced lengthy critiques of their own.

Among its major points, the EPA said that the AEC provided vague and mostly qualitative indications of its approach to major problems of reactor safety; that it provided no assurance that plutonium fuel could be protected from theft at an acceptable cost; and that the volume of wastes produced by large numbers of breeders may have been underestimated.

Most of the EPA's criticism, however, centered on the commission's optimistic analysis of the breeder's economic costs and benefits. The EPA points to half a dozen technical flaws or omissions, all of which have the effect of either inflating the projected benefits or minimizing the costs.

In several instances, for example, the AEC seemed to count some benefits twice—including $67 billion that the AEC believes the breeder would save in capital investment that would otherwise go for uranium production and enrichment. At the same time, the EPA said, the AEC had neglected to add into the cost column the $1 billion that private industry is expected to spend on breeder R & D.

Another irregularity concerns the AEC's choice of "discount rate" in its cost-benefit analysis. This is a measure of the cost of diverting money from other projects. In long-term efforts like the breeder program, the total amount of benefits projected is highly sensitive to the discount rate chosen.

For its purposes, the AEC used a rate of 7.5 percent, even though the White House Office of Management and Budget requires the use of a 10 percent rate (except in special cases, none of which, the EPA notes, apply to the breeder).

The EPA observes that the AEC's own analysis—with the higher rate plugged in, but without correcting for "double-counted" benefits and other flaws—shows that the breeder's economic benefits outweigh its costs by only 8.2 percent, a margin the EPA calls "only slightly favorable."

The EPA also concluded that the AEC's own analysis supported the view that deferring the start of the breeder economy "would not be intolerably costly," if such a delay were necessary to solve environmental problems or to explore alternative technologies more fully.

Many of these conclusions were stated in much less diplomatic language in a draft version of the critique, EPA officials acknowledged. The sharp phrasing was deleted, one official said, because "If you're going to nail somebody, it's better to do it with logic, not rhetoric."

—ROBERT GILLETTE

depending on how you look at it. And academics feel that universities are "unpopular" with the public and, therefore, with the politicians. Antiscience feeling in Britain does not seem to be virulent, although a strong "ban the bomb" movement in the past has resulted in something of a disposition to blame the bomb on scientists.

Unquestionably, the status as well as the image of scientists has slipped. This is reflected in the discontent of members of the scientific civil service, who are protesting what they argue is discriminatory treatment. The matter is complicated because their union, the Institution of Professional Civil Servants, includes a variety of professionals as well as what Americans would call semiprofessionals—technicians and draftsmen, for example—with a variety of grievances. But it seems to be true that scientists in the civil service have lost ground in recent years, with many of them being paid significantly less than members of the administrative corps of the civil service with comparable responsibilities.

If Labour continues in office with a working majority, what will be its general policy on science and technology? Certainly, Labour's new style is different. In contrast to its tactics when it took office in 1964, pledging a "white hot technological revolution" and creating a Ministry of Technology with a jazzy nickname, Mintech, to foment it, Labour has had little to say on the subject this time. The Conservatives late last year created an energy department out of elements of the Department of Trade and Industry (DTI) which had absorbed Mintech. Labour has embraced the energy department but has gone on to reorganize DTI into three sections dealing with trade, industry, and prices and consumer problems, headed by coequals in the Cabinet. Anthony Wedgwood Benn, erstwhile minister of technology, holds the industry portfolio. The science advisory apparatus in the Cabinet Office is also being reorganized and the think tank is expected to continue (Rothschild is a Labour peer), but as one senior departmental civil servant put it, "Frankly, we don't know yet what the setup is."

The issue of energy is obviously a key one for science policy. The Labour government is pledged to get better terms for the country from the international oil companies which are prospecting for and producing North Sea oil and gas, but a new formula is not proving an easy one to arrive at. As in the United States, research and conservation are expected to figure large in a new energy policy, but no such policy seems to be emerging, and the British face the added task of taking the Europeans into account—and for that matter the Americans—in their planning for energy for the rest of the century.

Energy research, however, is not expected to be a particular boon to basic research. Nor do there seem to be other promising sources of major relief. No cushion of unexpended funds remains in the budget, and prospects for transferring funds within the research council budgets to benefit basic research in the universities appear limited. In addition, the British must find ways to finance the increasingly expensive community projects to which they are committed with their European partners.

Given Britain's economic and political circumstances, a reversal of policy on science and higher education is thought highly unlikely irrespective of which party wins the anticipated election. So basic science in Britain would seem to be, at best, in a holding pattern.—JOHN WALSH

Science and Crime: Engineers Claim a Rosy Outlook, but Police Aren't Sure

One of the least publicly known incursions of science and technology into national life is the burgeoning field of domestic security and police technology. Yet this field constitutes a major high technology business which will pump more than $4 billion through the U.S. economy this year, if the estimated $3 billion private security market is combined with the $1 billion which the federal Law Enforcement Assistance Administration (LEAA) gives to local police departments.

Many developments in this field, such as laser fences and radar cadaver detectors, are as fantastic as Buck Rogers' disintegrator ray gun. Even the more mundane advances, such as fingerprint identification systems for company employees, are often elaborate and expensive. The technology comes in all sizes and shapes, and ranges from long overdue and useful modernizations to elegant gizmos that don't even work.

Crime fighting R & D even has its own scientific meeting. Every year since 1968, the University of Kentucky has sponsored the Carnahan and International Crime Countermeasures Conference.* This year, strolling over the grounds of Carnahan House, on a former Lexington race horse farm now owned by the university, a suitably diverse group gathered to expound the merits and demerits of preventing and fighting crime with machines. There were private detectives, industrial security agents, policemen, military engineers, officials from federal and local law enforcement groups, in addition to scientists from universities, think tanks, federal laboratories, and electronics and aerospace firms. Even the international set showed up—security experts from Canada, Great Britain, West Germany, and Israel.

What this year's conference illustrated was that police technology has become big business—to the delight of the private industries who are exploring the market, to the dismay of some civil libertarians, and to the occasional bafflement of the police themselves. One Department of Justice official explained on the first day: "The industries want to find a market for the stuff they've developed for the military. They're the sellers and we're the buyers. That's what's going on here." But, like other "buyers," this official was critical of the proffered technology. "The trouble is that a lot of this technology doesn't transfer very well from the military uses it was designed for." Another

* Past conference proceedings may be ordered from the Office of Research and Engineering Services, College of Engineering, University of Kentucky, Lexington 40506.