Technology in Britain: New Moves

London. Critics of the technology policies of the Labor Government may be somewhat encouraged by indications that Harold Wilson's cabinet intends to use its solid majority to push for innovation.

Before the election of 31 March there was informed and influential criticism to the effect that the Ministry of Technology, established in October 1964, was not operating as a true stimulator of industrial innovation. In this view, the Ministry of Technology, under former union leader Frank Cousins, was failing to use tough tactics to stimulate the adoption of new techniques in factories or to encourage the alliance between development work and sales efforts which is essential to commercial success (*Science*, 6 May).

Although responding to these criticisms will take time, some specific moves in April and May show a rise in the tempo of British government action concerning civilian technology.

Technology Minister Cousins has announced the long-awaited plan for stimulatiing the machine tool industry. This is one of the industries which the ministry supervises. Another is computers; a large program of loans to help develop new computers has already been started.

In his opening address at an exhibition of computer-controlled machine tools in London on 2 May, Cousins said that four contracts, totaling about $1.4 million, were to be placed soon for advanced machine tools and associated equipment. The machines built under these "pre-production" contracts will be tested in either government laboratories or appropriate factories.

At the same time Cousins announced that the National Research Development Corporation, which makes loans to encourage development of new technology, will set aside up to $2.8 million for a program to allow users to buy computer-controlled machine tools on a "sale-or-return" basis. Under this plan the customer would buy the machine but be allowed to return it any time between 6 and 24 months after purchase. The customer would receive a guaranteed repurchase price minus a use charge and a premium he would pay for the right to return the machine. The manufacturer would get government help in reconditioning and reselling the used machine.

Both these plans are intended to accelerate industry's acceptance of new machine tools, and hence of more modern production methods.

The next day Cousins addressed a conference of computer specialists and told them that further steps were needed to speed the acceptance of computers by British industry.

Cousins said that a director has been chosen for the projected National Computer Center near Manchester, and that a site has been chosen and staff recruiting has begun.

The Ministry of Technology, Cousins said, is studying the possibility of establishing a national computer "grid" to allow firms in all parts of Britain to share the capacity of giant, centrally located calculators.

In an interview with science reporter Brian Silcock of the *Sunday Times*, Cousins discussed the ministry's policy of encouraging agencies connected with the government to buy available British computer systems. For example, the Ministry of Pensions recently abandoned its preference for an American system of computers for its social service accounting and decided to buy a British system.

But this is no sign that the British Government will try to protect local computer manufacturers through a ban on purchases of American equipment. British European Airways, for example, continues to buy American computer equipment for its reservations system because it has a commitment to do so.

In discussing another field of action, Cousins announced on 25 April that a national service for the calibration of measuring equipment would be set up.

Meanwhile, the Ministry of Technology is proceeding with its long-term survey of the scientific and technical resources of the British Government, looking for waste and duplication. Important elements of these resources, such as the Atomic Energy Authority and the National Physical Laboratory, are controlled by the Ministry of Technology.

Cousins said in the *Sunday Times* interview that the survey, which is the personal project of John B. Adams, director of the Fusion Research Laboratory at Culham and the part-time "controller" of the ministry, "is the most important thing we're working on."

The opinion has long been widespread in Britain that there were large numbers of scientists in government laboratories who, if redeployed, could do work of direct significance to the civilian economy and to Britain's international trade.

A number of attempts have been made to start this process by encouraging special projects at the Atomic Weapons Establishment at Aldermaston —for example, the development of electronically controlled artificial hands and work on the desalting of seawater. The desalination project, which could improve the chances for export sales of the British-designed gas-cooled power reactor, is beginning to look rather big to Cousins, however. "We're beginning to think that desalination is something we've either got to go in for in a much bigger way or get out of altogether."

Not all the British effort to stimulate technology is being made by the Ministry of Technology, of course. Three recent examples will illustrate this.

The Department of Economic Affairs, headed by George Brown, announced on 5 April that it was launching a major comparative study of productivity in Britain and in the United States. The first industry to be considered will be the manufacturers of domestic appliances, such as refrigerators.

Previously announced plans for establishment of an Industrial Reconstruction Corporation are moving forward. The government announced the names of industrialists who will serve as part-time members of the IRC's board when Parliament passes the law setting up the corporation. The list was notably free of the usual names of retired civil servants or generals. The head of the Italian government corporation which partly inspired the British plan, the Instituto per la Ricostruzione Industriale, came to London for long informal talks on technology, research, and economic policy.

Answering a question in the House of Commons on 26 May, Reginald

Prentice, the Minister of Public Building and Works, said that his ministry had appointed a permanent committee to consider the applications of computers to construction.

There are signs that the Ministry of Technology is about to take up a new challenge. Edmund Dell, Cousin's recently appointed deputy, has said that the government and the British scientific instrument industry will have to get together to meet increasingly successful overseas competition. Dell told a meeting of the Scientific Instrument Manufacturers Association on 3 May that in 1958 only 11 percent of Britain's requirements for scientific instruments were being met by imports, whereas in 1964 the figure was almost 30 percent.

A major problem for the British instrument-makers, Dell said, was fragmentation: over half the firms had fewer than 100 employees and only 10 percent have over 1000. The smaller firms, he said, couldn't be expected to do enough research and development to keep up.

In all these fields, however, the British Government's attitude is against rule-making and compulsion and in favor of persuasion. "I can't be a dictator of British industry," Cousins told the *Sunday Times*. "I've got to persuade people to do things, just as I did when I was General Secretary of the Transport and General Workers Union."

On a recent visit to the Soviet Union, Cousins was told about a government program wherein industries were required to adopt new technology and were then compensated for any subsequent losses. "But you can't do that sort of thing in our political system," Cousins said. In general, the Russians face problems "very similar to ours," Cousins noted, "and they don't seem to be any closer to solving them."

He summed up his philosophy of persuasion this way: "The problem of modernization is persuading people to do things that they ought to know by themselves need to be done."

—VICTOR K. MCELHENY

Research and Industry in Czechoslovakia

Prague. The Czechoslovak government and the Czechoslovak Academy of Sciences have given strong support to the recently founded Institute of Macromolecular Chemistry here, where the use of hydrophilic polymers as contact lenses was developed.

The institute, directed by Otto Wichterle, has grown up rapidly, with a single-mindedness and on a scale unusual for Czechoslovakia, where scientists have had to compete vigorously for chronically short resources and where it is not uncommon to find an institute's laboratories scattered all over town, even in converted apartments.

The Institute of Macromolecular Chemistry occupies a large building sheathed in aluminum and green glass. The nine-story building stands on a commanding height at the end of a trolley line west of town. It is full of expensive modern equipment, a good deal of it American.

The staff of about 300, whose average age is under 30, was not pulled out of other laboratories, but was recruited directly, during university training, in the late 1950's and early 1960's. The recruitment goes on, chiefly among the 50 or so postgraduate students who now work at the institute.

The growth of the Institute of Macromolecular Chemistry shows that Czechoslovakia, like other countries concerned about their industrial expansion, has been led by this concern to make a large effort to encourage specific lines of basic research.

Although the institute limits itself fairly specifically to fundamental studies of synthetic macromolecules, there were practical, industrial pressures behind its foundation.

The chemical industry, including the production of man-made fibers, is important to Czechoslovakia. It is worth noting that the earliest-completed section of the great pipeline bringing Soviet petroleum from beyond the Urals terminates at Bratislava. Besides, Czechoslovakia remains in some ways the most industrially advanced nation in eastern Europe. She is thus an important supplier of chemicals and artificial fibers to other Communist countries, which, like Czechoslovakia, are seriously dissatisfied with their domestic growth rates.

But Czechoslovakia also requires greatly increased earnings of western currency in order to buy goods she cannot get elsewhere. An important way to earn such money is through the fees from patent licenses. The Institute of Macromolecular Chemistry has scored a notable success in this field with a patent on the use of hydrophilic polymers as contact lenses (see box).

The needs of the Czechoslovak chemical industry did not, however, lead Wichterle, or the Academy of Sciences, or the government to plan a laboratory too closely allied to existing industrial commitments.

The Academy, whose president is František Šorm, head of the institute of organic chemistry and biochemistry, accepted the idea of an institute that would emphasize basic research.

According to Wichterle, the work of the institute is not dictated by current industrial preoccupations but by its interest in basic research. Nonetheless, it is helpful if a theoretical laboratory can, without being required to do so, supply processes and chemicals of practical interest. One must never make the mistake, Wichterle says repeatedly, of feeling that basic research is "higher" than applied studies. Application requires the same inventiveness and creativity as more fundamental studies. Indeed, it can be argued that one of the most important kinds of "fallout" from an institute like Wichterle's is a continuing supply of scientific-minded people for industrial laboratories; there is a shortage of such people in Czechoslovakia.

Thus, Wichterle and his colleagues try to maintain friendly ties with industry because they know that such ties are essential to the application of their ideas. Men from the institute are members of boards of research labo-