rebuked him for not wearing a tie on the "Today" show). Those criticisms disturb Shapiro. He replies that the real "anti-scientific" people are those who "dump pesticides on Vietnam . . . perform heart transplants without first learning about rejection, and give masses of antibiotics to people who don't need them." In fact, he believes that his political work is "more scientific than most work in the labs." Solution of the real scientific problems of the nation, he says, requires, not more laboratory research, but more political work. His main example and concern is health care: the cures are there, the problem now is to make sure that everyone, including the poor, has access to them.

Shapiro says he still finds science "interesting" and is keeping up with developments by reading the journals and talking with his friends. He still maintains an office in a medical school laboratory building. He does not do any scientific work, but, just before our interview, he gave Beckwith some advice on an experiment. "I suppose if I were really absolute about this, I would not even talk about scientific work, but these are my friends and I am willing to help when they ask."

Another opinion of Shapiro's that others consider "anti-scientific" is the view that almost everyone in society, not just the trained scientists, has enough knowledge to decide where funds should be committed for research. "The shibboleth of technical expertise is preventing people from making decisions that are not beyond their intellectual capacity to understand," he says. He believes that it was government and big-business interests that were responsible for the decision to spend billions on the space program, and that, had the decision been left up to "the people," it (the program) would never have been started; the money would have been spent on what Shapiro considers more meaningful research—on pollution, for example.

The idea of having all of society decide what work scientists will do is part of Shapiro's political scheme. Sweeping changes, he says, are needed to end the "concentration of power in the hands of the few." In fact, he believes that "the people" should determine the work he himself should be doing. "It's not entirely up to me," he says.

This kind of radical sentiment will probably sound extreme—or perhaps even trivial—to most older scientists. But more and more younger scientists and scientists-to-be believe, with Shapiro, that American society is destructive and that scientists, often unwittingly, are responsible for some of its destructiveness. Even the older, more conservative scientists will have to agree that Shapiro has made a large sacrifice in an effort to get the word across.

—JAMES K. GLASSMAN

A recent graduate of Harvard, James Glassman is now a free-lance writer.

Government Labs: Britain Weighs Plan To Make Them Earn Their Way

London. One of the natural laws of research administration is that old government laboratories never die; they just live on, protected by Civil Service tenure, professional lobbies, local economic interests, and the very real difficulty of sifting reality out of their claims of productivity. In Britain, where most major research centers are government-owned and operated, there is a strong feeling that something should be done both to cut down the scale of the government research enterprise and to link it more closely to the country's economic and social problems. In nibbling fashion, both have been done; budgets and staffs have been reduced at many research centers, and the taking on of research jobs for industry has been encouraged (*Science*, 7 March 1969). But now, Britain's Ministry of Technology—the parent agency for the bulk of the government's applied research facilities—has put forth a radical proposition, one that merits the attention of other governments burdened with aging research establishments. Basically, what the Ministry is proposing is that a major segment of its research centers be cut off from the comforts of regular Treasury appropriations and sent into the competitive world of contract work for government and industry, very much on the style of the private consulting research organizations, such as Arthur D. Little and Battelle, that are well established in the United States but barely evident in Britain.

Put up for consideration in a "Green Paper"*—a format for presenting a position for debate, in contrast to a "White Paper," which states a settled government position—the Ministry's proposal calls for establishing a non-Civil Service public corporation, tentatively titled "The British Research and Development Corporation." To be headed by a government-appointed board, the BRDC would administratively pull together some dozen research facilities that currently employ approximately 4750 professionals, with an annual budget of nearly $170 million. The largest single group, 3200, are in the research and reactor centers of the Atomic Energy Authority, a self-contained entity within the Ministry of Technology empire. Included in the proposed corporation would be the AEA research establishment at Harwell, whose 1200 scientists and engineers handle many of the research responsibilities that the U.S. Atomic Energy Commission has assigned to its national laboratories at Oak Ridge, Tennessee, and Argonne, Illinois. For several years Harwell has been working its way into the field of industrial consulting and has served as a prototype for the program proposed by the Ministry. The Culham Laboratory, Britain's center for fusion research, would also be included, as would three reactor development centers, plus a few other facilities within the AEA.

In addition, the BRDC would encompass three major centers that the Ministry describes as "industrial research establishments." These are the National Physical Laboratory, roughly the equivalent of the U.S. National Bureau of Standards; the National Engineering Laboratory, for which there is no single U.S. government counterpart; and the Warren Spring Laboratory, responsible for many of the research functions that are handled in

* "Industrial Research and Development in Government Laboratories, A New Organization for the Seventies" (Her Majesty's Stationery Office, London), 30 cents.

the United States by the Geological Survey and the Bureau of Mines. The BRDC would also include two of the smaller facilities in the Ministry—the Hydraulics Research Station and the Forest Products Research Laboratory. Finally, it would absorb the National Research Development Corporation, which the government set up in 1949 to help promote the commercial exploitation of new inventions and processes. The Royal Aircraft Establishment and other aerospace facilities comprise a major portion of the Ministry's research activities, but they were left out of the proposed reorganization on the grounds that they have been reduced in size, are already deeply involved in civil work, and, on the military side, serve as a procurement agency for the armed services. Why these considerations should bar them from membership in the corporation is not clear. But aviation carries a lot of political weight in British political and economic affairs, and the Ministry may have concluded that its plans for reorienting government research toward profitability stand a better chance if they are unencumbered by the peculiarities and influence of the airplane business.

The Ministry, which, through a recent government reorganization, now functions more as a Ministry of Industry than simply as a Ministry of Technology, makes it clear that it is taking a cold-blooded view of the factors that should determine survival in research. Thus, while acknowledging that the government would remain the BRDC's biggest customer, and that straight grants would be the best means of supporting basic research and other activities of uncertain profitability within BRDC, the Ministry comes out, in effect, for letting the users of research determine whether the performers should continue to be supported. Thus, the Green Paper states that "specific tasks or projects for Government departments would be charged at full costs.

A gradual change to a contractual relationship should help to bring about a marked change of attitude within departments, which will have to pay for the work they want done, as well as within the Corporation, which will have to satisfy its customers." To which the paper adds that "it would be a healthy discipline for departments and organizations to have to pay directly for the programs they sponsor."

In regard to work for industry, the proposal links the BRDC even more closely to a marketplace scheme. "It is not possible to estimate exactly how much of such work industry would want," the paper states, "but if a new research and development organization were set up which would live to a growing extent on its earnings from contracts, joint ventures, royalty arrangements, etc., its success in meeting the needs of industry would play a part in determining the eventual level at which it operated."

On the subject of staffing, the paper bows to the Civil Service by recommending that employment conditions with the corporation be comparable to those that now exist in the laboratories. However, it then goes on to state, "The terms and conditions of service of employes recruited after it had been established would be a matter for the Corporation; but it would be important to ensure that staff could transfer readily between the Corporation, industry and other organizations both within and outside the Civil Service"—which, among other things, is another way of saying that the BRDC would not be saddled with the tenure regulations that have impeded past efforts at reorganizing research institutions.

With the Labor Government expected to put on a final legislative surge before the election that must be held sometime within the next year, there is a good chance that the BRDC may come into being. If it does, it will be worth watching, since the situation that inspired the concept is not confined to Britain.—D. S. GREENBERG

Defense: Laird Decentralization Alters Civilian, Military Roles

The Nixon Administration has wrought a fundamental change in the way business is done and decisions are made at the Pentagon. Defense Secretary Melvin R. Laird gives the process a name which sounds, curiously, as if he had borrowed it from the New Left. He calls it "participatory management." Power over the defense dollar is to be returned from the "bosses" in the defense secretariat, where it was concentrated by former Secretary Robert S. McNamara, to the "people." But at the Pentagon, the "people" are the military services, particularly the uniformed staffs of the Army, Navy, and Air Force.

The change has jumbled the Pentagon's bureaucratic pecking order, giving increased power to the military Chiefs of Staff and decreasing the stature of the civilian offices of Systems Analysis and Defense Research and Engineering. Even the military Joint Staff, which coordinates operations and plans for all three services, has diminished importance in the new emphasis on decentralized planning, budgeting, and weapons design. Finally, a new element has been added to the process of setting defense priorities. The National Security Council, a Cabinet-level policy board, now issues guidance on defense strategy and reviews the defense program before it is approved by the President.

New lines of power have not yet solidified. But these Pentagon shifts are worth recording for the obvious reason that, at a proposed level of $71.8 billion for fiscal 1971, defense spending will continue to represent the single largest federal activity and a very significant proportion of the new federal budget of $200.8 billion. (If trust fund expenditures for such programs as Social Security, Medicare, and highway construction are excluded, proposed defense spending represents about 46 percent of the new federal budget.)

The men who control defense budgeting and planning will have a very important voice in the future allocation of national resources. It seems fair to say that the uniformed services will be a great deal less likely than civilian defense analysts to propose the major reorientation and reduction of defense programs advocated by liberals of both major parties. Carrier admirals usually do not question the value of carriers, nor do bomber generals question the value of new bombers.

A shift toward decentralized management at the Pentagon was probably inevitable after McNamara's departure in 1968. The question, on which there is lively debate at the Pentagon, is how far Laird will allow the pendulum to swing. At the extreme pole is the model set by President Eisenhower's first Defense Secretary, Charles E. Wilson, who