

Federal Laboratories: Are They Adjusting to Changing Needs?

A congressional document with the titillating title "A Case Study of the Utilization of Federal Laboratory Resources" is a likely candidate, one might think, for prompt relegation to the dead-file, the only home some deserving, as well as a great many undeserving, documents have ever known. To suggest that the document just named actually lives and breathes and may in some way influence government policy is chancy, but perhaps justified.

The case study of federal laboratories was issued last month by the Research and Technical Programs Subcommittee of the House Committee on Government Operations. The subcommittee, chaired by Henry S. Reuss of Wisconsin, did not make the study itself but had it done by the Science Policy Research Division (SPRD) of the Library of Congress's Legislative Reference Service. The SPRD staff, once the scope of the study was agreed upon with the Reuss subcommittee, was free to arrive at its own findings. A foreword to the study states that its contents do not necessarily reflect the committee's views, although, in making the study public, Reuss said it revealed "major management deficiencies."

The essence of the study findings is contained in a single paragraph: "The federal government appears to know only approximately how many laboratories it has, where they are, what kinds of people work there, and what they are doing. Equipment is purchased, capitalized, and often forgotten. It seldom appears to reenter the management purview as a cost of laboratory operation. The laboratories themselves appear to be eternal. As national goals change, as agency missions shift to meet new public needs, and as the public becomes aware of these needs, new laboratories are created and present laboratories expand. Rarely are existing laboratories cut back or terminated. There is little evidence to suggest that federal laboratories are treated as a national resource to be continuously challenged by the assignment of important problems, requiring a continuing appraisal of capabilities and alternative courses of action."

The study sets forth, on the basis of information obtained by a questionnaire about federal "in-house" research activities in the field of environmental pollution, a number of policy questions and issues. One major question raised is whether the planning-programming-budgeting (PPB) system, instituted at the Defense Department at the outset of the McNamara regime and now being adopted throughout the government, may not largely overlook R & D activities. The purpose, of course, of the PPB system is to provide the information, such as 5-year cost projections and cost-effectiveness comparisons of program alternatives, that officials must have in deciding how available resources can best be used. The system is admittedly difficult to apply to R & D programs, and Bureau of the Budget directives acknowledge that basic research often cannot be related to specific agency missions.

"If the PPB system, or its equivalent,

is not adopted generally for federal laboratory resources," the SPRD study asks, "how can the matching of these resources with agency and government missions and with changing missions be appraised?" Other questions raised by the study include several on the problem of gauging effectiveness, such as, "How is progress toward the solution of national problems measured? How is it determined when the point of diminishing returns is reached? . . . Should the same criteria be used to evaluate federal capability as are used for contractors and grantees? . . . Who should make such appraisals?"

The study, it seems, is being taken seriously at the Bureau of the Budget, the place where it must be followed up if it is to be influential government-wide. "I found the study decidedly interesting," William D. Carey, assistant director of the bureau, told *Science*. "We're certainly going to follow up on it. Just what response it will get from this quarter, it's too soon to say. We don't want some central agency overseeing the laboratories. The real question is, how well are the agencies managing their own laboratories? This is what we will be looking into."

It is customary, of course, for federal officials to pay lip service to the suggestions and recommendations emanating from congressional committees. In this instance, however, Bureau of the Budget officials may be glad to get some new leads for investigation along a road they are already traveling. The bureau is pushing hard to have all agencies adopt the PPB system and examine existing and proposed programs more critically.

The federal laboratories represent so large an investment that a careful review of the management practices governing them is perhaps inevitable. Although in the past decade federal spending on R & D activities in government laboratories has grown much more slowly than federal R & D spending generally, the resources devoted to the "in-house" activities nevertheless have been enormous. The SPRD study, directed by Warren H. Donnelly and written by Lawton M. Hartman, uses NSF statistics to show that, of \$104.3 billion spent by the government on R & D "performance" from fiscal 1955 through fiscal 1966, \$23.3 billion was spent in federal installations.

Of the \$8.5 billion investment for the period in R & D "plant," \$6.7 billion was invested in federal facilities (\$2.7 billion of this was for facilities

New Bibliography Lists Congressional R&D Studies

One measure of the extent of congressional participation in decisions on federal support of research and development is to be found in a newly issued bibliography titled "An Inventory of Congressional Concern with Research and Development." Prepared by the Library of Congress for the subcommittee on government research of the Senate Government Operations Committee, the study, covering the last two Congresses, runs to 120 pages. According to the foreword, it lists all congressional documents that touch upon any part of the federal government's multi-billion-dollar expenditures for research and development. Copies may be obtained without charge by writing to the subcommittee, Room 217A, Old Senate Office Building, U.S. Senate, Washington, D.C.

of NASA and its predecessor agency). The investment in human resources likewise has been huge. According to an NSF report of 1963, the scientists, engineers, and technicians working in federal laboratories exceeded 300,000.

In the SPRD case study, 192 federal laboratories or groups of laboratories were reported to be doing some R & D work (or monitoring and sampling) related to environmental pollution. The participation of this large number of facilities, operated by nine different agencies, in one area of research caused the authors to ask, "Are many small laboratories more efficient and effective than a smaller number of larger centers?" Some scientists, aware of the administrative burdens and complexities of large research laboratories, would answer affirmatively.

The authors of the study were impressed by what often seemed a surprising lack of information at the headquarters of various agencies about agency laboratory facilities—information which, if readily available, could facilitate management decisions. They were impressed, too, by the fact that, while scores of new laboratories interested in environmental pollution have been established during the last 50 years, few laboratories have been closed. Moreover, in the case of 116 laboratories for which information was obtained, 75 had had no change of mission during their history. Here, however, the study took note of the U.S. Geological Survey's comment: "The substance or depth of analysis might change, but not the basic questions. Each new problem, such as detergent pollution or pesticide residues, is, in reality, an old problem with a new name."

The study may be criticized by some scientists for seeming to suggest that there is greater inflexibility and inertia in the deployment of scientific and technical personnel than there actually is. The abler scientists and engineers who hear, via the grapevine, of exciting new opportunities in their field often may quit their present jobs if they are working on problems of declining interest or importance. Some "redeployment" always goes on, whether or not it follows from conscious management decisions.

On the other hand, it may be argued that this constant shifting of talent as new centers of interest and opportunity develop is one of the reasons why the SPRD study deserves attention. Laboratories lose vitality through the de-

parture of their bright young men. In such situations, a reexamination by management of the laboratory's performance and *raison d'être* seems indicated. Is the laboratory still productive? Is its orientation too narrow? Has it overlooked new opportunities? Does its mission still represent a real need?

Edward M. Glass, assistant director of Defense Research and Engineering (for laboratory management), believes that the SPRD study is useful in that it has emphasized the need for the government to look at its internal R & D establishment on a systems basis. Although Glass says DDR&E has been giving a great deal of attention to this matter, he adds, "Sometimes we need a report like this to point out that more needs to be done."

Glass observes that, even though most R & D activities may not be placed within the defense budget's broad mission categories (strategic offensive systems, strategic defensive systems, and the like), it is important that they be related to specific missions within the R & D category. He notes that the Defense Department has some 140 in-house research, development, testing, and evaluation (RDT&E) activities. "The question is," he said, "can

we fashion the in-house organization to get a better focus on important problems?"

Glass regards the large Naval Ordnance Test Center at China Lake, where the focus is on air-to-air and air-to-ground missile systems, as an excellent example of how RDT & E activities can be oriented to specific missions. It is better, he believes, to have various R & D units grouped together and given a broader mission orientation than to have them widely scattered with each pursuing its own narrow objectives (be it R & D on propulsion, aerodynamics, or something else).

The questions raised by the SPRD study doubtless will receive wider and earlier attention within the government if the Reuss subcommittee follows up the study with hearings next year. The subcommittee's agenda will not be fixed until after the new Congress has convened and the chairman has met with his colleagues to discuss priorities. Whatever the subcommittee does, Reuss already seems to have accomplished something by bringing out a report which has stirred interest in the Bureau of the Budget, where great power resides.—LUTHER J. CARTER

Research in Washington: Plans Afoot for Advanced Study Center

Ever since George Washington tried and failed to establish a national university in the nation's capital, plans have been offered, with varying degrees of success, to raise the city's status in the world of scholars. Nevertheless, Washington still ranks in the bush leagues of scholarship, although it contains some of the world's greatest libraries, several universities and colleges, a host of research institutions, and large numbers of resident and visiting scholars.

Now a new effort to get at the problem is under way—specifically, an effort to establish an institution, or perhaps several institutions, where scholars might have space, quiet, and assistance in using Washington's extensive research resources without having to be affiliated with any particular institution.

Several developments have taken place in the past year or so. The first was in April 1965, when the Smithsonian Institution announced that it was including an advanced study center in its plans for renovating the old Smithsonian building. Two floors are being converted for use of visiting scholars and scientists; the facilities will include study rooms, offices, meeting places, lounges, a dining-room, a library, and space for special activities and entertainment. Congress appropriated \$2.1 million for the renovation, and, hopefully, the job will be completed by next summer.

The next encouragement for a scholars' center came last March, when members of the House and the Senate introduced identical resolutions urging establishment of an "International Cen-