aging large projects. This point was made at great embarrassment to the foundation in the mid-1960's by Project Mohole. A technically grandiose scheme to penetrate the Mohorovicic discontinuity by deep ocean drilling, Mohole soon developed costs and management and technical complexities that made it clear that its backers inside and outside the foundation should have known better. It has been argued that the Mohole fiasco damaged congressional confidence in NSF to an extent that retarded support for basic research, but, at a minimum, it made the foundation chary of large technical undertakings.

By the later 1960's, however, NSF was responsible for several major installations and was administering big national and international programs. The Daddario reorganization bill represented de facto recognition that NSF had to come to grips managerially with a more diverse mission and complicated program structure.

To strengthen foundation management, the reorganization act provided for the creation of five upper-level posts to be filled by presidential appointment—a deputy directorship and four assistant directorships. Salaries in the higher-thirties range and the prestige of the presidential imprimatur were designed as inducements to capable prospects. There was some ambiguity about whether those in the new statutory jobs would fill staff or line functions—whether they were to administer subdivisions of the foundation or provide staff support to the director. This ambiguity actually increased McElroy's opportunity to leave his imprint on the foundation, since he would not only fill the five posts with his own selections, but, inevitably, influence the way the agency would operate in the future by the duties he assigned the new officials.

In the event, McElroy steered a middle course on the line-staff question, giving each of the new appointees a major area of NSF activities to oversee, but also using them to form an executive council to deal with planning and policy decisons.

The four assistant directors' names were announced in March 1970 (*Science*, 3 April 1970). Edward C. Creutz, then vice president in charge of research for Gulf General Atomic, became assistant director for research, which means he administers the traditional basic research programs of the foundation. Thomas B. Owens, a Navy rear admiral who was chief of naval research, became assistant director for national and international programs, which involves administering research facilities now under NSF's wing and handling the logistical and other problems of the international programs in which the United States participates. Lloyd G. Humphries, a former head of the psychology department at the University of Illinois, became assistant director for education, and Louis Levin, a veteran NSF staff member, became assistant director for institutional programs. A deputy director was not named until August 1970, when the post went to Raymond Bisplinghoff, a NASA administrator during the space agency's expansionary days who came to NSF from M.I.T., where he had been dean of engineering. As No. 2 man at NSF, Bisplinghoff has been playing a key role in the innovative programs—for example, the start-up phase of the new R & D incentives program, which is designed to stimulate private industry investment in R & D.

The lag time in appointments to top posts contributed to the growth at NSF of some uncertainty, frustration, and personal bitterness during a period that would have been difficult enough anyway. McElroy himself did not arrive until a half year after the Administration took office. The 11th-hour Administration shift away from the appointment of Franklin Long to the NSF directorship (*Science*, 18 and 25 April 1969) delayed the process. When McElroy did take over the job, he was faced with the task of deciding how to carry out the reorganization, recruiting men for new top jobs, and then getting

Briefing

Tough Talk on NSF

Word has it that Senator Edward M. Kennedy (D–Mass.) is unhappy about three aspects of the present operation of the National Science Foundation (NSF). He plans to do something about it—perhaps spurring major changes —when his special subcommittee on NSF holds hearings on its budget authorization this spring.

Kennedy is worried about NSF's ability to conduct goal-directed, problem-oriented, and socially relevant research, and his first area of concern is the RANN program (Research Applied to National Needs), which is the NSF's major effort in doing just that. Kennedy has doubts about how well RANN is working and plans to scrutinize the program closely in the hearings of his subcommittee, which is a part of the Senate Committee on Labor and Public Welfare.

Second, Kennedy favors increasing NSF's capacity to award research contracts and grants to industrial firms. At present, NSF interprets its founding act as requiring disbursements primarily to universities and other educational institutions. Kennedy is considering amending the act so that a larger slice of the NSF pie can go to industry. The theory behind the move is that many industrial R & D firms are better equipped than universities to take on technical and social problems, such as crime control, which are typically interdisciplinary and relatively unstructured.

A third plan now brewing in Kennedy's office would force structural changes in the organization of NSF. Kennedy is considering writing into the language of the Senate authorization bill explicit requirements that NSF spend specific sums on particular national problems, such as health care services, education technology, transportation, and public safety (the latter including such goals as crime control, fire prevention and suppression) as well as further development of nonlethal weapons.

However, an attempt by the Kennedy subcommittee to force NSF to spend money on itemized projects could backfire. The House Committee on Science and Astronautics used a similar tactic last year when it switched money from the RANN program to the popular institutional support program and compartmentalized the NSF budget so that the Foundation could not switch the money back. All that happened was that the Office of Management and Budget, which opposed the move, withheld the money earmarked for institutions, and NSF was ultimately $30 million the poorer.—D.S.