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A Revised Charter for the Science Foundation

A bill has been proposed which could make NSF more effective in meeting contemporary demands.

Emilio Q. Daddario

On 18 January 1966, the Committee on Science and Astronautics of the House of Representatives unanimously approved a report (*1*) of its Subcommittee on Science, Research and Development in which they recommended certain changes in the structure and functions of the National Science Foundation.

The Subcommittee's report was the culmination of a study that began late in 1964 and ran throughout 1965. It was the first comprehensive legislative review of the Foundation in the 15 years of NSF's existence, and it was preceded by a careful factual survey of the Foundation's operations which had been made at the Subcommittee's request by the Library of Congress (*2*).

Seven weeks of hearings then went into this effort, plus additional weeks of executive consideration by the Subcommittee itself.

As a result of this work and of the full Committee's backing, I have introduced in the House H.R. 13696, a bill to effect the changes recommended. We expect to send this bill to the House floor for debate by spring.

What does the bill provide and what do we intend it to do?

Before launching into a description, I should like to make a few brief comments regarding the rationale and the philosophy behind this legislation.

The subcommittee's report, which is the basis for H.R. 13696, is a critical one and was so intended. It is not critical of the Foundation as an institution, however, nor of its personnel. Our criticism is directed toward the Foundation's relatively slow evolution in relation to the swelling, fast-changing contemporary problems of the nation and in regard to the Foundation's underutilized potential as a member of the Executive's scientific and technological family.

In stating this criticism we do not seek to assess fault. The modern world being what it is, I doubt if we could point any fingers with accuracy even if we spent the time necessary to attempt it. Moreover, there is little doubt in my mind that Congress—which until recently has never bothered to exert real oversight of the Foundation—is partially responsible for the situation which our report describes.

Let me summarize that situation by quoting from the report:

> The Foundation is operating, and is largely organized to operate, in a manner which was satisfactory a decade ago but which does not appear adequate for either today or tomorrow. . . . The fact is that the Foundation has not kept pace with the demands of society nor adequately oriented itself within the shifting machinery of government. . . . Fundamentally, it may be said that the Foundation has functioned, and still does, in a manner that is

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largely passive. It has not itself put a sustained effort into developing substance, form and direction of the programs it supports. Once granted its annual budget, NSF has to a large extent followed a practice of waiting for talented outsiders to suggest appropriate projects on which to spend it.

Lest these words, taken somewhat out of context, be considered unduly harsh, I must add that there have been some good reasons why NSF has developed as it has, why its policies have been slow to change, and why it has lost some of its intended stature and force to the Office of Science and Technology. I am not sure that the Foundation could have evolved otherwise.

Nonetheless, the report indicates Congressional concern when it adds:

> The time is past due for the Foundation to assume a more positive, dynamic stance. And there are good reasons for this, too.
>
> The first is that the problems of living in today's environment are reaching proportions which are truly monumental. It is conceded that they will not be solved without an equally monumental lift from science and technology. Foundation guidance in focusing upon allied areas of appropriate research and education could be a major factor in maintaining the stability of a civilization which is today seriously threatened by the surfeit and concentration of people and their problems. . . .
>
> Secondly, the Federal government's interest in and support of R&D has become so broad and pervasive that the development of national policy concerning it has become correspondingly difficult. . . . The Foundation's input toward the evolution of national science policy, never strong, seems to have weakened further in recent years. . . . There should be, and is, a scientific and technological stature about the Foundation sufficient to warrant an extraordinary voice in the science policy chambers of the administration. NSF is the only Federal agency with an exclusive scientific mandate. It should make itself heard, and should be listened to, accordingly. . . .
>
> Thirdly, it is now apparent that as the nation's scientific resources, including manpower, become more and more in demand to meet the exigencies of modern living, the Federal departments and agencies will depend more heavily on the Foundation to pursue avenues of research which they themselves cannot provide or afford. At the same time, the government will need better overall evaluation of the status of our science resources and of individual scientific disciplines and their potential. The Foundation is the logical government component to provide such assistance.

This is the heart of the matter. We hope H.R. 13696, after appropriate hearings and amendments, will bring about improvements.

Without in any way diminishing its original mission of supporting basic research and science education, we want to make NSF more sensitive to the shifting winds of our national scientific climate and the government's role therein. When NSF was formed it was given unique responsibilities in the crucial field of basic research; for the good of the nation it should now step forward and speak with the loud voice of a senior partner in the scientific and technological echelons of the executive branch. We do not want NSF's posture to be reduced to the nodding mechanisms of a junior colleague or the note-taking silence of a staff operation.

Purpose of the Bill

The proposed legislation has four major purposes. These are: (i) to bolster the Foundation's mission, giving consideration to changes already effected by several reorganization plans (*3*); (ii) to strengthen and add to the functions of the National Science Board; (iii) to strengthen the authority of the Director; and (iv) to modify the Foundation's organization and structure.

We believe it is now essential that the Foundation move ahead with positive, forward-looking plans and programs. In relation to the Office of Science and Technology and the President's Science Advisory Committee, the Foundation should take the initiative and be held broadly responsible for the nation's science resources, disengaging OST and PSAC from their detailed oversight in this area. OST and PSAC would thus be enabled to devote more time to national issues of applied science and development and to marshaling the resources of science and technology toward the solution of immediate practical problems. The Foundation obviously should continue its cooperation with and assistance to OST.

Toward the fulfillment of these objectives, H.R. 13696 would require NSF to:

1) Evaluate the state of the various sciences and their needs.

2) Evaluate the condition of national scientific and technological resources, including adequately trained manpower.

3) Direct, where indicated, some research—basic or otherwise, and including engineering—to help bring the scientific base for new and emerging technologies required in the national interest to the point where their development can proceed through other federal agencies and industry. This will be especially important as we strive to satisfy the major physical problems of urban living—such as transportation, pollution, water supply, housing, and population growth.

4) Channel more effort into promising areas of the social sciences.

We believe it would make good sense if the character and functions of the National Science Board could be strengthened, with special attention given to a more effective relationship with the Director as he administers NSF affairs. At the same time, the Board should also develop a more potent and utilized capability as a national advisory body available to both executive and legislative councils, with particular reference to science resources and policies governing them.

Among the improvements that H.R. 13696 would effect are:

1) Streamline the functions of the Board so as to relieve it of routine administrative duties.

2) Provide the Board with a small staff, from the roster of Foundation personnel, which would devote full time to the Board's administrative needs and activities.

3) Require the Board to provide Congress with an annual report which "shall include an assessment of national scientific resources and trained manpower; an assessment of basic scientific progress and an indication of those aspects of such progress which might have implications for the needs of American society."

We believe the authority of the Foundation's Director should be widened so as to give him power to administer NSF affairs with a minimum of protocol or the necessity of going through *pro forma* routine. He should be empowered and encouraged to delegate administrative authority in order to facilitate and improve the managerial quality of the Foundation's performance; the increasing pressure of future demands on the Foundation will make this essential. The Director's prestige and influence within the Executive family should be enhanced.

Toward this end H.R. 13696 would:

1) Empower the Director to pass on all proposals for NSF support, subject to Board restraint in regard to new or exceptional cases.

2) Give the Director complete management authority over NSF operations.

3) Make additional high-level staff with managerial as well as scientific background available.

4) Add legislative authority permit-

ting the Director to delegate such decision-making functions as he deems appropriate.

5) Elevate the Director's pay grade to place him on a par with the highest official of any of the independent offices of the federal government.

6) Permit the Board to delegate such policy-making functions as it considers appropriate to the Director or the Foundation's executive committee.

In addition to the foregoing, the proposed legislation would provide authority and direction for NSF to reorganize internally along functional lines rather than in categories of specific scientific disciplines. The present statutory requirements on this matter are clearly outmoded. They force the Foundation into strained interpretations and positions in order to cope with present-day needs—which undoubtedly will become more burdensome in the days ahead.

This provision, together with others encouraging the delegation of authority by the Director and setting up additional high-level staff to which responsibility for specific areas of NSF activity may be turned over, is designed to permit the Foundation to take advantage of modern managerial science. This is an obvious necessity. Since we expect NSF to support the contemporary requirements of science and technology in an efficient manner, we must eliminate those barriers which deny it the ability to use the results of managerial and operations research in the conduct of its own administration.

Some Words of Caution

The cold print of a law or bill, standing alone, is often susceptible to misinterpretation or distortion. I should like to discuss several points, some of which have already been raised as issues.

For example, we have recommended an accelerated role for the Foundation and for the National Science Board with regard to the making of government policy on scientific and technological matters—but only in connection with science *resources*. This means (i) scientific manpower and its training, (ii) the development, collection, collation, and dissemination of science information in certain areas, and (iii) development of scientific and technologic facilities.

In these areas we would have NSF assume responsibility in general for Federal guidance—not direction. The reasons, I think, are clear. Across-the-board policy determination on the science area properly belongs to the Office of Science and Technology—or, in many instances, to the Federal Council for Science and Technology. Moreover, the function of evaluating the scientific research programs of all federal agencies has been given to OST by Presidential reorganization and has been concurred in by Congress. And, obviously, the many policy decisions which the Executive Office handles—including the hundreds of important day-to-day pragmatic choices the government must make with regard to science and engineering and their application to national needs—can only be formulated with the help of inputs from many governmental sources.

Along these same lines, it is equally clear that policy-making which deals with federal support for science and technology cannot be contained in one overall master plan or centralized blueprint. The situation is far too complicated to sanction this sort of approach, even if such approach were desirable —which is doubtful. If it were, the responsibility would undoubtedly have to be assumed at the Executive Office level.

The legislation provides authority for the Director to support *some* applied research or engineering, at his discretion, in areas where research appears promising in regard to the alleviation of a basic national problem. The bill does not *direct* NSF to undertake such research, and it should not be regarded as a move to put NSF generally into the field of applied research and development. Contemplation of that sort does not exist in our Committee.

What is intended is that the Foundation be permitted to support research of this kind where national need is great enough to justify it, where the research field involved is not adequately being investigated by others and, even then, to pursue it only to the point where other agencies or private parties may take up the endeavor and develop it further.

We have stated often that the future is likely to require NSF to assume a "balance wheel" function in the support of basic research. That is, as other federal agencies either drop or fail to support certain important segments of basic research, according to their needs and budget, NSF may have to provide a balancing effect through added support of its own.

However, this does not mean that Congress either wants or expects the Foundation to assume responsibility for all basic research. Far from it. We realize very well the value of having basic research sponsored by a number of different agencies—not only in order to satisfy the mission needs of the agencies themselves, but because of the benefits which flow from a variety of interests and approaches wherever basic research is pursued.

As indicated in the foregoing, the proposed legislation requires a report to the Congress by the National Science Board dealing with the status and health of science and technology, including an assessment of progress made during the previous year together with identification of such progress as may have significance for technology and our national needs. Along the same line, the bill would require the Foundation to take on the responsibility for a continuing evaluation of the status and needs of individual sciences. This evaluation should be helpful to the Board, as well as others, in preparing the report.

However, there is no intent here to pin a time-consuming, repetitive task on either the Board or the Foundation staff. We would not expect a complete evaluation and report each year on every science discipline or every phase of technology. We would expect the Board to be selective, to report on areas and developments which appear to it most significant, most timely, where achievement has occured, or where the greatest gaps and needs exist. We are thinking, in this regard, in terms of a report to the nation somewhat akin to the President's annual Economic Report. A similar report on Science and Technology, we believe, could be highly useful to Congress and beneficial to the nation and the scientific community.

Other Recommendations

Finally, our report contains a number of nonlegislative recommendations which may be vulnerable to misunderstanding.

For example, we recommend that the President, as well as Congress, make use of the Board as an instrument of advice on scientific issues. This does not represent an effort to supplant or duplicate the President's Science Advisory Committee. It is an effort merely to make a competent alternative source of advice available to the President,

particularly in regard to matters dealing with science resources. Far from hindering PSAC in its functions, such a service by the Board might relieve PSAC of some of its numerous burdens and permit it to concentrate on specific, important, practical missions.

We have recommended more support for institutional and developmental grants. But let me emphasize that we recommend this with the reservation that the project-grant system not be downgraded as a consequence. We are projecting a situation in which NSF budgets will be expanded to permit acceleration of institutional aid without damage to established project research.

We have recommended a more active role for NSF in international affairs and in the support of international scientific activities.

We have also suggested that science attachés abroad be provided and budgeted in whole or in part by the National Science Foundation, although they might work with and within the foreign service system and be responsible organizationally to the State Department. This procedure seems worth exploring, since it would encourage closer relationships between the State Department and the Foundation and perhaps give a boost to a program which is suffering from personnel and financial anemia.

We are hopeful that the Department will bolster its international science office, give it sufficient backing and funds to develop a comprehensive, useful program. The program should be responsive (i) to the political and mission needs of the Department, and (ii) to the needs of the American scientific community. We see no reason why NSF-provided science representatives could not handle one or both functions while attached to the State Department's foreign service, assuming adequate staffing and financing. This latter seems likely to come about more readily with NSF as a partner in the arrangement than if the State Department is obliged to carry the entire program alone.

Certainly the better scientific people we have, the more effective they will be in either capacity. And from the standpoint of an adequately continuing or uniform career, NSF may be in the better position to provide such personnel.

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NEWS AND COMMENT

Exporting the Great Society: Funds Are a Limiting Factor

In a speech at the Smithsonian Bicentennial Celebration last September, President Johnson got off one of his more arresting public phrases when he said, "we mean to show that this Nation's dream of a Great Society does not stop at the water's edge," and went on to assert, "It is not just an American dream. All are welcome to share in it. All are invited to contribute."

The President was in an expansive mood and justifiably so since Congress was in the final phase of a 2-year outpouring of education, health, and other Great Society legislation. His proposals in the Smithsonian speech, titled "The Noble Adventure," were stated in the most general terms, but he made two main pledges: "to assist the education effort of developing nations" and regions and to help schools and universities in the United States "to increase their knowledge of the world and the people who inhabit it."

Early in February the President sent to Congress a message on international education and health which was a sequel to the Smithsonian speech and filled in some of the blanks. While the message attested to the President's commitment to the idea, it also reflected fiscal stringencies imposed by the costs of the war in Vietnam and the coming due of early payments on major Great Society programs.

Like the President's message on domestic education and health, the international message calls for some new legislation but relies fairly heavily for impact on revised priorities and changed orientations in existing programs through administrative action. Affected are both our activities in international organizations such as the World Health Organization and unilateral programs such as those operated by AID.

The United States, it must be noted, has never really had a program in either international health or international education. Rather, we have sponsored a multiplicity of separate programs operated by a variety of agencies. American commitments abroad in health and education have grown greatly since World War II, but they have grown untidily, and, because of bureaucratic separatism gap and overlap have been familiar phenomena.

By talking about international education and health programs in terms of integrated, long-term policy, in a special message, the President gave public prominence to the subject. At the same time, there is plenty of evidence that the White House is pushing for action in the agencies to improve both the coherence and the coordination of these programs.

Likely to be most affected by the new effort is the Department of Health, Education, and Welfare. In his message the President asked Congress, among other things, to declare that "the Department of Health, Education, and Welfare is charged with a broad authority to help strengthen our country's capacity to carry on this noble adventure."

HEW is directly—it appears, exclusively—involved in the only legislation so far put forward specifically to implement the message. These are administration-inspired bills on education and health. The new international education bill has been introduced by Senator Wayne Morse (D–Ore.), chairman of the Senate subcommittee on education, and by Representative Adam