



The Scientific and the National Communities

The following is a condensation of an address by William D. McElroy, Director of the National Science Foundation, before the annual meeting of the American Physical Society in Washington, D. C., April 29, 1970.

As you know, our wartime successes encouraged a rapid expansion of the national investment in the sciences. The surge in investment produced many benefits to the country—making it a world leader in scientific productivity and achievement. We all have good reason to be proud of these accomplishments.

As a result of this success and increased investment, the scientific community grew rapidly in numbers. If there was an imbalance between available resources and the size of the scientific community during the early part of this postwar period, the last few years have certainly restored equilibrium.

Even as the scientific community grew in size, it was still able to maintain the so-called “invisible college,” the informal communication network which bonded together individuals with common interests and problems. These ties kept scientists together in professional brotherhood and were a key element in scientific advance. Also, new scientific journals and computerized information systems supplemented personal communications and reinforced the sense of community between scientists.

Unfortunately, the relationships of science to society were not as rich and diverse as those within the scientific community. It is true that the counsel of

scientists was sought more and more by the Government. The President's Science Advisory Committee, the National Academy of Sciences' Committee on Science and Public Policy, and of course, individual scientists testifying before Congress are examples.

We all enjoy perfect hindsight, and from this vantage point we see that the relationships I have just mentioned were too few, too spasmodic, and too superficial. They were by request, or when the scientific community wanted something. There was seemingly no genuine, sustained attempt by the science community to create a sense of understanding, participation, or commitment. It is a tribute to the American people that despite this lack of communication they so willingly gave so much support to the scientific community. What's more, this generous support was given on terms and conditions which were unusually liberal. The relationship between the science community and the larger community of taxpayers and their representatives often seems to have been largely predicated upon a generalized faith in the good of science.

Now we see signs of a breakdown of that relationship. We are all painfully aware that there is a developing imbalance between the size and needs of the scientific community and the resources, Federal and private, available.

Even more threatening than funding issues are the emerging conflicts between traditional scientific values—such as knowledge for the sake of understanding—and general community alarm about specific aspects of our technological society. While I appreciate and encourage these public (and Governmental) concerns, the nation must above all preserve its commitment to the fundamentals of basic science investigation—trained

professionals of the highest quality pursuing problems of their own choosing. Without this commitment, America compromises her future. The body of first-rate scientific knowledge that we do have today represents a major element in our cultural heritage. But in the ranking of national priorities, it is becoming increasingly clear that other, more pragmatic values are moving to center stage.

I believe there must be changes in the way we think, in what we do, and why we do it. The scientific community must be more responsive to the nation's—the general community's—needs. But we must not be so responsive that we lose our commitment to fundamental research. Clearly, a proper base must be established on which basic science can carry out its changing role.

—The total Federal funding for the scientific community must be increased. And this means, I believe, that we must devise a more pragmatic, more benefit-conscious justification for these funds. A “science is beautiful” rationale is not sufficient. In addition, we must come up with a systematic method for the planning of a national science policy.

—As the first step is gradually achieved, the second step should be to allocate the increase so that the NSF proportion is large enough to build a stable base of support for pure, undirected, disciplinary research. Added to this larger base, we intend to build a multitude of problem-oriented research programs. We must also be willing to end such programs when their mission is achieved without disturbing the stable base of fundamental research.

The so-called “Mansfield Amendment” will move NSF in the direction of supporting a greater proportion of basic research. However desirable this end might be, I am, nonetheless, concerned because it may have ill-considered side effects, including a further isolation of the defense community. Furthermore, the dropoff in DOD support resulting from the Mansfield Amendment and other agency budget restrictions may be substantial, and full provision has not been made to fund this research elsewhere.

Whether or not we achieve the goals of higher and stabler funding under the NSF umbrella, we must still face up to the fundamental question of funding for what?

At the outset, let me repeat as I have said on many previous occasions—the core mission of the NSF is, and will remain, the fostering of fundamental scientific research.

At the same time, we accept the concept that the traditional research objectives of the scientific community can be supplemented by research oriented to the

problems of society. We see no necessary incompatibility between these values. It is simply the linking of our conscience as human beings to our curiosity as scientists. It is also the linking of the several science communities to the national communities.

Two main points distinguish today from yesterday in the NSF support of projects of short-range utility directed to the problems of society. First, such research is being undertaken at an accelerated rate and on a broader scale than heretofore. Secondly, the NSF, which has been responsive almost exclusively to unsolicited proposals in the past, will now, in certain areas, actively seek proposals wherever competence can be found for this ad hoc, shorter-range research.

Important as these changes are, we cannot lose sight of the fact that today's new directions may become tomorrow's old fads. How will we anticipate tomorrow's challenges? How can we assess them? If we are not to stumble into the future; if we are to give the future a voice in the present; we are obligated to plan for it. For the NSF, one mechanism to do this was Public Law 90-407, providing for the establishment of five new statutory positions—a deputy director and four assistant directors.

These individuals, the offices immediately associated with me, and I will together form a coherent policy planning group within the NSF. As such, it will serve as a continuing point of program development and policy review. It is my hope that a top-level group of this type will enhance the ability of the NSF to adapt to the new conditions which will surely confront us in the future.

Once again, I emphasize the need of the science community to adapt to new scientific problems and new social purposes. Yesterday it was Sputnik; today it is the environment; tomorrow it may be a crisis of crises. Whatever the crises that may confront us at any particular moment, the health of science will depend, over the long run, not only on its resources, but also on its adaptability and sensitivity to the needs of the general community. Even if science were lavishly funded and a basic schism existed between science and society, science would not be truly viable. Conversely, if the resources available to science are less than desirable, but if society identifies its values with those of science, the outlook for science's long-term viability will be excellent. It is this concept, the idea of bringing the community of science into harmony with the larger community of the nation, that has influenced much of my action to date and will continue to do so in the future. I know the physical science community wants to participate in these new directions in service of the nation and mankind, and I intend to make the Foundation one instrument for such participation. ■