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New Initiatives at NSF

Some of the new or expanded programs recently undertaken at the National Science Foundation are likely to have substantial effects on the development of science and technology. As one example, in 1985 NSF will begin support of university centers for cross-disciplinary research in engineering. This is in reponse to concern about the state of engineering research and training in our nation's colleges and universities. Computers, robotics, telecommunication, and information management have radically transformed engineering and manufacturing processes. But few university departments have the instruments required to provide hands-on experience for their students. Also, engineering practice has evolved into team attacks on problems, but university engineering research has remained the domain of small single-investigator programs. The new engineering centers program is a significant step toward improving the diversity and quality of engineering research and training.

Another NSF initiative concerns research equipment and instrumentation. At many colleges and universities, equipment is outmoded. For a decade prior to 1983, funds for buying equipment in NSF grants did not keep pace with the need. Increases in the 1984 budget have partially restored purchase of equipment to its place of importance in grants and university budgets. However, in many fields, academic science instrumentation still lags behind that available to industry or to the defense community. Continued emphasis on instrumentation will be required to undo a decade of neglect.

A third initiative at NSF involves supercomputing. In order to do first-rate research today, many scientists and engineers must have access to computers for modeling and data analysis. In a sense, supercomputers are a special subset within the whole problem of scientific instrumentation. We have been attacking the supercomputer problem in three ways. First, we support the research that scientists and engineers need to develop the most advanced computers. Second, in order to increase academic access to supercomputers, NSF has arranged for large blocks of supercomputer services at the University of Minnesota, Purdue University, and Boeing Computer Services and is offering these services on a competitive basis to scientists and engineers as part of their research grants. Finally, we intend to establish advanced computing centers throughout the country and to develop nationwide networks to allow research scientists to have access to a variety of supercomputer facilities.

My experience in Washington causes me to offer some parting advice to those involved in complex fields involving interdisciplinary research. In research fields that incorporate a number of different disciplines, it is especially important that investigators develop a clear-cut consensus as to what needs to be done and how to do it. This helps unify the research community, bringing developments in various disciplines to the scrutiny and attention of colleagues in other fields. This, in turn, builds bridges between disciplines and helps generate exciting new approaches to old problems. Carefully considered priorities also help decision-makers in the executive and legislative branches of government make the choices that affect scientific work and the health of the scientific community.

Finally, NSF should continue to emphasize that its role is the development and maintenance of the health of American science and engineering—a far bigger role than that of only a grant-making agency. The emphasis that has been placed on developing the entire university scientific system must be continued and expanded. We can only have scientific leadership if we train the best scientists; it is the people that count.—EDWARD A. KNAPP,* *Senior Fellow and Research Adviser, Los Alamos National Laboratory, Los Alamos, New Mexico 87545*

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