

SCIENCE

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National Institute for Science and Technology

The National Institute for Science and Technology (NIST)* is enjoying substantially enhanced funding and status at a time when most U.S. research and development (R&D) organizations face uncertain futures. Direct federal appropriations for NIST that were \$246 million in fiscal 1992 are \$520 million this year and are projected to rise to \$935 million in fiscal 1995. NIST is expected to be a key federal factor in facilitating improvements in U.S. global economic competitiveness. Rationale for showering funds on NIST includes its special culture in which cooperation with many branches of industry has long been a way of life.

Prior to 1988 NIST was known as the National Bureau of Standards (NBS). Research to create precise weights and measures and distribution of thousands of calibrated samples provided benefits to many companies. The NBS maintained an excellent worldwide reputation. However, during much of the Cold War its budget was static. Direct appropriations were about \$200 million a year in 1990 dollars. Many of the staff of 3000 found it necessary to seek and obtain funds from other government agencies such as the Department of Defense. The change in NBS's fortunes began in 1988. Congress perceived that the United States was lagging in global competition. It passed legislation changing the name to NIST and mandating an emphasis on improving U.S. technology.

New programs were initiated at NIST. They included a Manufacturing Extension Partnership (MEP) and an Advanced Technology Program (ATP). These initiatives were well-chosen mechanisms for responding to the needs of the times. Plans for them were carefully made and then they were launched on a pilot scale. The MEP responds to a national need to upgrade the capabilities of hundreds of thousands of small manufacturing companies. Many of them need guidance in utilizing computer-based manufacturing and other advances in technology. By 1992 seven Manufacturing Technology Centers were established. These are located in areas with relatively high concentrations of industrial firms. They are managed by local sponsors and draw on expertise from a wide variety of sources, including universities. They are partially supported by federal funds channeled through NIST. They have already established a record of effectiveness. Their number is being increased.

The ATP began in 1990 with an initial \$10-million allotment. The Clinton Administration has expanded support and has stated an intention to recommend that the annual appropriation be \$750 million in fiscal 1997. The broad objective of the ATP is to promote rapid commercialization of high-risk technologies. ATP relies on industry to suggest, define, and implement R&D programs having potential substantial long-term economic impacts. A large number of companies apply to participate. Selection criteria used by NIST are designed to identify recipients who have excellent R&D plans and a vision of how success in them would be translated into competitive marketable products. The companies also must furnish half of the funds to implement R&D programs which are to be conducted in their facilities. Once they receive awards, their progress is monitored. Awards to individual companies are limited to \$2 million over 3 years. Awards to members of joint ventures can be for up to 5 years. Past awards have been made in a broad spectrum of technologies, including agriculture, biotechnology, microelectronics, machine tools, and information technology.

Latest awards, made 25 April, involve a 5-year government investment of \$745 million in five new R&D programs. The ATP had received more than 550 project proposals since last October. Based on ideas in more than 150 of the proposals, the five new program areas were selected. These included Tools for DNA Diagnostics and Computer Integrated Manufacturing for Electronics.

With only a tiny fraction of the U.S. R&D budget, NIST is expected to perform the next thing to miracles. Although participation in and management of new programs will require extensive attention, there will be only a small increase in total staff. Some personnel will be diverted from basic research to projects closely related to technology. The ongoing research program at NIST will receive support for improved facilities.

NIST is the focal point of a major experiment in government-industry collaboration. Staff members who have central roles have high morale and the thrill of participating in an important mission.

Philip H. Abelson

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