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Maintaining Scientific Primacy

The eagerness of both parties to increase support for scientific research* has, for the scientific community, an element of déjà vu. The increased funding is highly welcome, as a needed corrective to chronic underfunding in several areas and recent budgetary damage to others. But, if such support is not to prove evanescent, the scientific community must be articulate about the dynamics driving the need for funding increases. One such dynamic is the cost of national primacy in science: the ever-rising expense of maintaining a frontier position in scientific research and of advancing at the margins. Instrumentation, the level of training, and computational demands all scale upward in cost and complexity as research becomes more demanding. Many of the concerns in this country related to the health of science—its support and its institutions—stem from the pressures of being at the scientific frontier, at the top of a very slippery climb.

Other countries are now climbing that slope. Japan and France, for example, have both acknowledged a limit to dependence on derivative science for their future technological capacities. They and other nations are already contesting our primacy in various fields of scientific research, and even more will do so. We ought to welcome the competition, for as long as we see to our own house we will gain greatly from the scientific advances of other nations.

Such an argument is seemingly contradicted by the current, and proper, concern with U.S. capacities in global technological competition. However, while basic research is a component of technological competition in global markets, it is not the most critical element. Moreover, the scientific endeavor should transcend the momentary frictions of such competition. It is—or should be—a global binding agent, uniting all cultures in the common quest to understand nature and to improve the human condition.

If the United States (or any nation, for that matter) is to gain from intensified scientific competition, the essential requirements are open communication of science and the resolve to incur the costs of maintaining general excellence in basic research. Regarding open communication, the Matthew principle applies: those that have the most to give have the most to gain. The strength of American science ensures our capability to benefit from progress in any field elsewhere.

The budget now going through Congress will be a major factor in retaining scientific strength and, therefore, in gaining from the advances of other nations. But beyond the program increases—essential to enriching the substance of science—we need to examine the institutions of science. For example, public and private research universities—the "home of science" in the United States—are, with the rest of the economy, suffering from financial pressures. Overall, the patterns of state, federal, and private support continue to be volatile, the embedded costs of graduate education are rising, and some of the usual subsidies for graduate education may no longer be available.

Other elements underpin our leadership in world science, such as the health of American education. There now is a national awakening to our potentially disastrous weaknesses in science and mathematics education. A number of bills are in Congress, and the budget for fiscal year 1984 contains new initiatives in science education. In the past, the nation's concern with education was fleeting. We need to emplace enduring programs.

The United States will face difficulties in staying at the frontiers of science. But if we maintain the excellence of our research, we stand to gain a great deal from the first-class research of other nations. Required of us is a commitment to keep our research institutions strong, to ensure stability in funding basic research, and to insist on open communication of science among all nations.—FRANK PRESS, *President, National Academy of Sciences, Washington, D.C. 20418*

*C. Norman, *Science*, 8 April, p. 174.