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Scientific Openness and National Security

Bruce Alberts

Science is an international enterprise that embraces the importance of sharing information as one of its core values because the building of new knowledge onto old knowledge drives scientific advances. At the same time, the scientific community recognizes the importance of protecting U.S. national security interests from foreign espionage. How then are we to react to news reports of the possible theft of classified information from our nation's weapons laboratories and to the ensuing calls in Congress for increased restrictions on foreign visitors to national laboratories? Concern about possible new restrictions on foreign scientists has led the National Academies to issue a statement (available at www.national-academies.org/topnews/) and to initiate a fast-track study, with a workshop in August 1999 that will examine how best to ensure the dual objectives of international communication among scientists and protection of classified information.

"Inappropriate restrictions could harm U.S. interests..."

Inappropriate restrictions could harm U.S. interests by impeding the nation's scientific progress, weakening its role as a key player in the international scientific community, and endangering international cooperative activities in areas that bolster national security, such as nuclear safety, weapons proliferation, and environmental cleanup.

An ability to maintain strong international ties has been critical to the strength of U.S. science. For example, one-quarter of the 1900 U.S. members of the National Academy of Sciences were born in another country. Of the students who received their Ph.D.'s in science at U.S. universities in 1997, 33 percent were foreign born. Our nation's well-being continues to depend on the many intellectual contributions of individuals who have come from other countries.

Although the national laboratories of the Department of Energy (DOE) are engaged in classified military work, they also carry out a large amount of unclassified scientific and engineering research. Many of the foreign scientists who visit them are invited because they bring important new knowledge. A wide range of scientific expertise is essential for maintaining the intellectual vitality and quality of these laboratories and for sustaining their capacity to attract and retain promising young talent.

Several studies by the National Academies have articulated the importance of increasing openness to promote the security systems necessary for controlling chemical, nuclear, and biological weapons. The 1997 National Academy of Sciences report *Controlling Dangerous Pathogens* emphasizes that appropriately structured U.S.–Russian scientific cooperation, featuring direct lab-to-lab contact, is needed to increase the certainty that work on biological weapons is not continued in Russia. Likewise, the 1999 National Research Council report *Protecting Nuclear Weapons Material in Russia* concludes that "continued DOE involvement in strengthening material protection, control, and accountability in Russia should be a high-priority national security imperative for the United States for at least a decade."

International scientific exchanges can also be a key to finding peaceful resolutions to very difficult issues. Last February, for example, scientists from Israel, the Palestinian Authority, Jordan, the United States, and Canada issued an important joint report on managing the dwindling water resources in the Middle East (available at www.nap.edu/html/waterfuture). Although regional water management is in large part a political issue, wise decisions will depend on application of the best scientific and engineering knowledge.

In the post–Cold War era, the U.S. scientific and engineering communities have increasingly been called on to play diplomatic roles in establishing international partnerships. They have facilitated progress in such areas as counterproliferation, demilitarization, environmental cleanup, nuclear safety, and counterterrorism, while helping to divert foreign military manpower toward civilian goals. These interactions, which are clearly in the nation's best interests, require openness and free communication among scientists. Maintaining these interactions and simultaneously protecting our nation's classified information are critical for our long-term security.

The author is president of the National Academy of Sciences.