provide the Foreign Service Institute, the primary training arm for the department, with the technology and mandate to offer continuing education and distance learning on S&T for personnel. A clear signal early would be the inclusion in the entrance examination of questions testing a basic understanding of fundamental scientific concepts and the nature of scientific inquiry.

Similarly, department leadership should offer the Foreign Service Institute, the primary training arm for the department, with the technology and mandate to provide continuing education and distance learning on S&T for personnel. Foreign Service officers must have a knowledge base on which to build when needed. Otherwise this elite corps will be ill-equipped to conceptualize and understand forces transforming international relations and modern diplomacy and bereft of requisite intellectual tools to represent U.S. foreign policy interests.

Should the State Department fail to muster the requisite intellectual and organizational strength to influence and implement policy on S&T-infused international challenges, this primary foreign policy instrument will gradually lose its relevance to major U.S. interests around the world. At best, current departmental responsibilities gradually will be absorbed and managed by other U.S. governmental agencies, nongovernmental bodies, and private industry. At worst, the technologically empowered—foreign nations or nonstate actors—with objectives counter to ours may prevail, and our nation's economic, security, and other interests will suffer accordingly. Without doubt, in the post–Cold War world a Department of State bereft of S&T competence will be increasingly irrelevant to our nation's international interests.

References

1. E. Claussen and P. Kennedy, "Proposed reorganization of OES" internal State Department memo, 11 April 1997. Eileen Claussen, a non-career officer, departed the State Department in July 1997.
2. L. M. Branscomb and J. H. Keller, *Investing in Innovation* (MIT Press, Cambridge, MA, 1998), p. 479.
3. Formerly the Critical Technologies Institute, the RAND Corporation's Science and Technology Policy Institute is mandated to serve the White House Office of Science and Technology Policy (OSTP) and federal government agencies at OSTP discretion.

POLICY FORUM: SCIENCE AND GOVERNMENT

Put Science and Technology Back into Foreign Policy

J. Thomas Ratchford

Science and Technology (S&T) strongly affect foreign policy, and vice versa. Although both are low-saliency topics in the public mind, the importance of this relation has been long recognized. Presidents have noted the relationship. Secretaries of State have established committees and personnel policies designed to enhance it. Reports, often based on exceptionally competent studies and analyses, have been issued by respected and influential groups. Congress thought it had solved the problem of integrating S&T and foreign policy with the carefully crafted Title V of the Foreign Relations Act of FY 1979. Not only have these well-intentioned efforts come to naught, but we are regressing. Today the United States is in an unenviable position. Among the world's leading nations, its process for developing foreign policy is the least well coordinated with advances in S&T and the policies affecting them.

Elegant organizational constructs and unfunded legislative mandates for the Department of State cannot work. The commonsense approach is to give the federal research and development (R&D) agencies the policy direction and resources to do for State much of what it has not been able to do for itself. Only this will catalyze the necessary two-way interchange between science and engineering on the one hand and foreign-policy development on the other. Specifically the federal R&D agencies should (i) provide personnel to State for overseas posts; (ii) aggressively address the analytic needs associated with S&T in foreign policy, including effects of global policies on S&T; (iii) coordinate and enhance federal agency reporting on foreign S&T through regional condominium arrangements; and (iv) complement recruiting the best research talent internationally with much greater funding to send outstanding U.S. researchers to foreign centers of excellence.

The National Science Foundation (NSF) is the logical agency to coordinate this effort and to provide the analytic capability. Resources should be made available to the Foundation, but most funding must come from the other R&D agencies. People are the most important ingredient in this recipe, and the personnel systems in the R&D agencies, unlike that of the Foreign Service, provide a reward structure compatible with getting and retaining excellent scientific and engineering talent that is also competent to deal with complex policy issues.

Now is the time to make these changes. Long-standing budgetary constraints preclude the State Department from vigorous action, even if the will to act were there. The initiative must come from elsewhere: the scientific and engineering communities, the White House, and the Congress. Leaders from all these groups recognize that in the post–Cold War era, S&T and foreign policy have more, not fewer, interrelationships. The AAAS Board has identified international S&T as one of five areas deserving special attention in the development of a new science policy. Office of Science and Technology Policy (OSTP) Director Neal Lane has a long track record of support for international S&T cooperation. OSTP Associate Director for National Security and International Affairs, Kerri-Ann Jones, has quietly worked within the Administration to deal with the problem. F. James Sensenbrenner Jr., Chairman of the House Science Committee, has not been shy in focusing his attention and that of his committee on international S&T issues such as those related to megascience. The ranking Democrat on the Science Committee, George E. Brown Jr., has stated that "disjointed" is the most polite term he could think of in describing the U.S. approach to international S&T cooperation, and supported long-range planning for international S&T activities. The National Science Policy Study of the U.S. House of Representatives, chaired by Science Committee Vice Chairman Vernon Ehlers, showed its interest in the topic by devoting one of its seven hearings to international science. Ehlers noted in the 25 March hearing that the American people should better understand the importance of international S&T, including both the scientific benefits to American researchers and the important spillover effects on U.S. foreign policy.

Scientists and engineers are problem solvers. The fact that S&T are not properly integrated with foreign policy is a big problem. Both Congress and the White House seem interested in dealing with it. The federal R&D agencies can provide a solution. It is time to stop analyzing and to get the job done.

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