10 Science at the U.S. Department of State

Frank E. Loy

I want to talk about a subject that is very important to Secretary Albright and to me: the role of science in shaping our foreign policy. A few weeks ago, I had the pleasure of meeting with your board chair, Dr. M.R.C. Greenwood. She was most generous in sharing her experience and providing her advice on how we might go about getting more "science savvy" into the State Department. During the course of our conversation, I noted that the Department was not a scientific agency. She raised one eyebrow and said, "we've noticed."

Now, I am not quite sure what she meant. But I know what I meant: Our job is to develop and conduct a sound foreign policy—taking fully into consideration the science and technology that bears on that policy. It is not to advance science. Therefore, scientists have not been, and probably will not be, at the center of our policy-making apparatus.

But I also know this: The advances and changes in the worlds of science and technology are so rapid and so important that we must ask ourselves urgently whether we really are equipped to take these changes "fully into consideration" as we go about our work.

I believe the answer is "not quite." We need to take a number of steps—some of which I will outline in a moment—to help us in this regard. Some we can put in place right now. Others will take years to work their way through the system. One thing I can say: I have found in the State Department a widespread and thoughtful understanding of how important science and technology are in the pursuit of our foreign policy goals. The notion that this has somehow passed us by is just plain wrong.

I might add that this sanguine view of the role of science was not always prevalent. In a 1972 Congressional Research Service study on the

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interaction between science and technology and U.S. foreign policy, Dr. Franklin P. Huddle wrote: "In the minds of many today, the idea of science and technology as oppressive and uncontrollable forces in our society is becoming increasingly more (sic) prevalent. They see in the power of science and technology the means of destruction in warfare, the source of environmental violation, and the stimulant behind man's growing alienation."

Today, though, as we look into the 21st century, we see science and technology in a totally different light. We see that they are key ingredients that permit us to perpetuate the economic advances we Americans have made in the last quarter century or so and as the key to the developing world's chance to have the same good fortune. We see at the same time that they are the key factors that permit us to tackle some of the vexing, even life-threatening global problems we face—climate change, loss of biodiversity, the destruction of our ocean environment, proliferation of nuclear materials, international trafficking in narcotics, and the determination by some closed societies to keep out all influences or information from the outside.

We began our review of the role of science in the State Department for two reasons. The first was part of a larger task the Secretary asked me to undertake: to assure that the various "global foreign policy issues"—such as protecting the environment, promoting international human rights, meeting the challenges of international narcotics trafficking, and responding to refugee and humanitarian crises—are fully integrated into our overall foreign policy and the conduct of U.S. diplomacy abroad.

She felt that the worst thing we could do is to treat these issues, which affect in the most profound ways our national well-being and our conscience, as some sort of sideshow instead of issues that are central challenges of our turn-of-the-millennium foreign policy. We all, of course, are fully aware that these global issues—as well as our economic, nonproliferation, and weapons of mass destruction issues—cannot be adequately addressed without a clear understanding of the science and technology involved.

This brings me to the second impetus for our review: We have heard the criticism from the science community about the Department's most recent attention to this issue. We are very sensitive to your concerns and we take them seriously. That is, of course, why we asked the National Research Council to study the matter and why we are eager to hear more

from you. Our review is definitely spurred on by our desire to analyze the legitimate bases of this criticism and to be responsive to it.

Let me also note that while we have concluded that some of these criticisms are valid, others are clearly misplaced. However misplaced they may be, somehow we seem to have fed our critics. The entire situation reminds me of something Casey Stengel said during the debut season of the New York Mets. Called upon to explain the team's performance, he said: "The fans like home runs. And we have assembled a pitching staff to please them."

I would like to outline my thoughts on three topics:

- A vision of the relationship between science and technology and foreign policy in the 21st century.
- One man's evaluation of how well the Department has, in recent times, utilized science in making foreign policy determinations.
- How we might better organize and staff ourselves in order to strengthen our capacity to incorporate science into foreign policy.

The Role of Science and Technology

Until a decade ago, our foreign policy of the second half of this century was shaped primarily by our focus on winning the Cold War. During those years, science was an important part of our diplomatic repertoire, particularly in the 1960s and 1970s. For example, in 1958, as part of our Cold War political strategy, we set up the NATO Science Program to strengthen the alliance by recruiting Western scientists. Later, we began entering into umbrella science and technology agreements with key countries with a variety of aims: to facilitate scientific exchanges, to promote people-to-people or institution-to-institution contacts where those were otherwise difficult or impossible, and generally to promote our foreign policy objectives.

The Cold War is now receding into history—and the 20th century along with it. We in the Department have retooled for the next period in our history with a full understanding of the huge significance of science in shaping the century ahead of us. But what we have not done recently is articulate just how we should approach the question of the proper role of science and technology in the conduct of our foreign policy.

I would like to suggest four parts to such an approach:

- First, and most important, we need to take the steps necessary to ensure that policymakers in the State Department have ready access to scientific information and analysis, and that this is incorporated into our policies as appropriate.

- Second, when consensus emerges in the science community and in the political realm that large-scale, very expensive science projects are worth pursuing, we need to be able to move quickly and effectively to build international partnerships to help these mega-science projects become reality.

- Third, we should actively facilitate science and technology cooperation between researchers at home and abroad.

- And fourth, we must address more aggressively a task we undertook some time ago—mobilizing and promoting international efforts to combat infectious diseases.

And we need to find a way to ensure that the Department continues devoting its attention to these issues long after Secretary Albright, my fellow undersecretaries, and I are gone from there.

Our Performance

Before we chart the course we want to take, let me try a rather personal assessment of how well we have done in the past. And here we meet a paradox: Clearly, as I noted earlier, the State Department is not a science and technology-based institution. Its leadership and senior officers do not come from that community and relatively few are trained in the sciences. And as some of you have pointed out, our established career tracks, within which officers advance, have labels like political, economic, administrative, consular, and now public diplomacy—but not science.

Some have suggested that there were no science-trained people at all working in the State Department. I found myself wondering if this were true, so I asked my staff to look into it. After some digging, we found that there were more than 900 employees with undergraduate majors and more than 600 with graduate degrees in science and engineering. That is about five percent of the people in the Foreign Service and six

percent of those in the Civil Service. If you add math and other technical fields such as computer science, the numbers are even higher.

Now you might say that having 1,500 science-trained people in a workforce of more than 25,000 is nothing to write home about. But I suspect it is a considerably higher number than either you or I imagined. More important, I would say we have gotten fairly adept at getting the science we need, when we need it, in order to make decisions.

One area where this is true is the field of arms control and nuclear non-proliferation. There, for the past half-century, we have sought out and applied the latest scientific thinking to protect our national security. The Bureau of Political-Military Affairs, or more accurately, the three successor bureaus into which it has been broken up, are responsible for these issues and are well-equipped with scientific expertise. One can find there at any given time as many as a dozen visiting scientists providing expertise in nuclear, biological, and chemical weapons systems. Those bureaus also welcome AAAS Science and Engineering Fellows on a regular basis and work closely with scientists from the Departments of Energy and Defense. The Undersecretary for Arms Control and International Security Affairs has a science advisory board that meets once a month to provide independent expertise on arms control and non-proliferation issues. This all adds up to a system that works quite well.

We have also sought and used scientific analysis in some post-Cold War problem areas. For example, our policies on global climate change have been well informed by science. We have reached out regularly and often to the scientific community for expertise on climate science. Inside the Department, many of our AAAS Fellows have brought expertise in this area to our daily work. We enjoy a particularly close and fruitful relationship with the Intergovernmental Panel on Climate Change (IPCC)—which I think of as the world's largest peer review effort—and we ensure that some of our best officers participate in IPCC discussions. In fact, some of our senior climate experts are IPCC members. We regularly call upon not only the IPCC, but also scientists throughout the government, including the EPA, the DOE, NOAA, NASA and, of course, NAS and NSF as we shape our climate change policies.

Next, I would draw your attention to an excellent and alarming report on coral reefs, which was released by the Department just last month. This report is really a call to arms. It describes last year's bleaching and mortality event on many coral reefs around the world and raises awareness of the possibility that climate change could have been a factor. Jamie Reaser, a conservation biologist and current AAAS Fel-

low; and Peter Thomas, an animal behaviorist and former AAAS Fellow, now a Senior Conservation Officer, pulled this work together—drawing on unpublished research shared by their colleagues throughout the science community. The Department was able to take these findings and put them in the international spotlight.

A third example involves our recent critical negotiation in Cartagena, Colombia, concerning a proposed treaty to regulate transborder movements of genetically-modified agricultural products. The stakes were high—potential risks to the environment, alleged threats to human health, the future of a huge American agricultural industry, and the protection of a trading system that has served us well and contributed much to our thriving economy. Our negotiating position was informed by the best scientific evidence we could muster on the effects of introducing genetically-modified organisms into the environment. Some on the other side of the table were guided less by scientific analysis and more by other considerations. Consequently, the negotiations did not succeed. This was an instance, it seemed to me, where only a rigorous look at the science could lead to an international agreement that makes sense.

Augmenting the Science and Technology Capability at State

In painting this picture of our performance, I do not mean to suggest that we are where we ought to be. As you know, Secretary Albright last year asked the National Research Council (NRC) to study the contributions that science, technology, and health expertise can make to foreign policy, and to share with us some ideas on how the Department can better fulfill its responsibilities in this area.

The NRC put together a special committee to consider these questions. In September, the committee presented to us some thoughtful preliminary observations. I want to express my gratitude to Committee Chairman Robert Frosch and his distinguished colleagues for devoting so much time and attention to our request. And I would like to note here that I have asked Richard Morgenstern, who recently took office as a Senior Counselor in OES, to serve as my liaison to the NRC committee. Dick, who is himself a member of a National Academy of Sciences committee, is going to work with the NRC panel to make sure we are being as helpful as we can be.

We will not try to develop a full plan to improve the science function at the State Department until we receive the final report of the NRC.

But clearly there are some steps we can take before then. We have been discussing them within the Department, with the NRC Committee, and with scientists from this organization, including Chairwoman Greenwood, past Chairwoman Dresselhaus, Dick Getzinger, Bob Stern, and others.

We have not yet made any final decisions. But let me share with you a five-point plan that is designed to strengthen the leadership within the Department on science, technology, and health issues and to strengthen the available base of science, technology and health expertise.

Establish a Science Advisor

The Secretary should have, it seems to me, a science advisor to make certain there is adequate consideration within the Department of science, technology, and health issues. To be effective, such an advisor must have appropriate scientific credentials, be supported by a small staff, and be situated in the right place in the Department. The "right place" might be in the office of an Undersecretary or in a bureau—such as the Bureau of Oceans and International Environmental and Scientific Affairs. If we chose the latter course, it would be prudent to provide this advisor direct access to the Secretary.

Either arrangement would appear to be a sensible way to assure that the advisor has access to the Secretary when necessary and appropriate, but at the same time, is connected as broadly as possibly to the larger State Department structure and has the benefit of a bureau or an Undersecretary's office to provide support. There is an existing position in the State Department that we could use as a model for this—the position of Special Representative for International Religious Freedom, now held by a Ambassador Robert Seiple. Just as Ambassador Seiple is responsible for relations between the Department and religious organizations worldwide, the science advisor would be responsible for relations between the Department and the science community. And just as Ambassador Seiple, assisted by a small staff, advises the Secretary and senior policymakers on matters of international religious freedom and discrimination, the science advisor would counsel them on matters of scientific importance.

Establish Science Roundtables

It seems to us that when a particular issue on our foreign policy agenda requires us to understand better some of the science or technology involved, we should reach out to the science and technology community and form a roundtable of distinguished members of that community to assist us.

We envision that these roundtable discussions would take the form of one-time, informal gatherings of recognized experts on a particular issue. The goal would not be to elicit any group advice or recommendations on specific issues. Rather, we would use the discussions as opportunities to hear various opinions on how developments in particular scientific disciplines might affect foreign policy.

I see the science advisor as being responsible for organizing such roundtables and for making sure that the right expert participants are included. But, rather than wait for that person's arrival in the Department, I would like to propose right now that the Department, AAAS, and NAS work together to organize the first of these discussions. My suggestion is that the issue for consideration relate to genetically-modified organisms, including particularly genetically-modified agricultural products. It is clear to me that trade in such products will pose major issues for U.S. policymakers in the years to come, and we must make certain that we continue to have available to us the latest and best scientific analysis.

It is not clear whether such roundtables can or should take the place of a standing advisory committee. That is something we want to discuss further. It does strike me that while "science" is one word, the Department's needs are so varied that such a committee would need to reflect a large number and broad array of specialties and disciplines to be useful. I would be interested in your views as to whether such a committee could be a productive tool.

So far, we have been talking about providing leadership in the department on science, technology, and health issues. But we also need to do something more ambitious and more difficult—that is, to diffuse more broadly throughout the Department a level of scientific knowledge and awareness. The tools we have available for that include recruitment of new officers, training, and reaching out to scientific and technical talent in other parts of the government and in academia.

If you are a baseball fan, you know that major league ball clubs used to build their teams from the ground up—by cultivating players in their farm systems. Nowadays, they just buy them on the open market. We would do well to emulate the old approach, by emphasizing the importance of science and technology in the process of bringing new officers into the Foreign Service. We have got a good start on that—eight of the 46 members of a recent junior officers' class had scientific degrees.

Train State Personnel

In addition to increasing our intake of staff with science backgrounds, we need to stimulate the professional development of those in the Department who have responsibility for policy, but no real grounding in science.

During the past several years, the Foreign Service Institute (FSI)—the Department's training arm—has taken two useful steps. First, it has introduced and beefed up a short course in science and technology for new officers. Second, it has introduced environment, science, and technology as a thread that runs through the entire curriculum. Regardless of officers' assignments, they now encounter these issues at all levels of their FSI training. But we believe this may not be enough, and we have asked FSI to explore additional ways to increase Department staff's access to other professional development opportunities related to science and technology.

A couple of weeks ago we wrapped up the inaugural session of a new Environment, Science, and Technology training program for Foreign Service National staff who work at our embassies. Twenty-five of them spent two weeks at the Foreign Service Institute learning about climate change, hazardous chemicals, new information technologies, intellectual property rights, and nuclear non-proliferation issues.

Leverage Our Resources

I have not yet raised the severe resource problem we encounter at State. I believe that we can and must find ways to deal with our science and technology needs despite this problem. But make no mistake about it: State has not fared well in its struggle to get the resources it needs to do its job. Its tasks have increased and its resources have been reduced. For example, between 1991 and 1998, the number of U.S. embassies rose

by about 12 percent and our consular workload increased by more than 20 percent. During the same period, our total worldwide employment was reduced by nearly 15 percent.

That has definitely had an impact on the subject we are discussing today. For example, we have had to shift some resources in the Bureau of Oceans, Environment, and Science from the science to the enormously complex global climate change negotiations.

But I want to dwell today on what we can do and not on what we cannot. One thing we can do is to bring into the Department, on long- or short-term assignments, more scientists from other agencies or from academia.

Let me share with you a couple of the other initiatives we have going:

- We are slowly but surely expanding the AAAS Diplomatic Fellows Program in the Bureau of Oceans and International Environmental and Scientific Affairs. That program has made these young scientists highly competitive candidates for permanent positions as they open up. To date, we have received authorization to double the number of AAAS Fellows working in OES from four per year to eight, and AAAS has expanded its recruiting accordingly.

- We are talking with the Department of Health and Human Services about a health professional who would specialize in our infectious disease effort. We are also talking with several other agencies about similar arrangements.

I should point out here a particular step we do not want to take: We do not want to re-establish a separate environment, science and technology cone, or career track in the Foreign Service. We found that having this cone did not help us achieve our goal of getting all the officers in the Department—including the very best ones—to focus appropriately on science. In fact, it had the opposite effect—it marginalized and segregated science. After a while, the best officers chose not to enter that cone because they felt it would limit their opportunities for advancement. We are concerned about a repeat performance.

Use Science as a Tool for Diplomacy

As for our scientific capabilities abroad, the State Department has 56 designated environment, science, and technology positions at our posts overseas. We also manage 33 bilateral science and technology "umbrella

agreements" between the U.S. government and others. Under these umbrellas, there are hundreds of implementing agreements between U.S. technical agencies and their counterparts in those countries. Almost all of them have resulted in research projects or other research-related activities. Science and technology agreements represented an extremely valuable tool for engaging with former Warsaw Pact countries at the end of the Cold War and for drawing them into the Western sphere. Based on the success of those agreements, we are now pursuing similar cooperative efforts with other countries in transition, including Russia and South Africa. We know, however, that these agreements differ in quality and usefulness and we have undertaken an assessment to determine which of them fit into our current policy structure and which do not.

We have also established a network of regional environmental hubs to address various transboundary environmental problems whose solutions depend on cooperation among affected countries. For example, the hub for Central America and the Caribbean, located in San Jose, Costa Rica, focuses on regional issues such as deforestation, biodiversity loss, and coral reef and coastline management. We are in the process of evaluating these hubs to see how we might improve their operations.

Conclusion

The eminent British physicist C.P. Snow observed that politics is concerned with the short term while science is more concerned with the long term. He said he hoped there would come a day when politicians will start to take a longer view of the world and their role in it, and scientists, occasionally, will take a shorter one.

So, to conclude, let me say that I have tried candidly to give you an idea of the state of our thinking on science at State. And I have tried to give you some reason for optimism while keeping my proposals and ideas within the confines of the possible. Needless to say, our ability to realize some of these ideas will depend in large part on the amount of funding we get for them. As long as our budget remains relatively constant, resources for science and technology will necessarily be limited.

Again, I know the NRC plans to give us its final recommendations in the fall. We look forward to that and we expect to announce some specific plans soon thereafter. We will be very interested in working with you in refining those plans if need be and in bringing them to fruition.