

American Association for the Advancement of Science (AAAS)
Center for Science Diplomacy

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Preface

As we approach the end of the first decade of this new millennium, society faces numerous challenges — from developing and prospering sustainably to combating diseases, from ensuring security to driving economic innovation — that are global in scale, and have science and technology as important components. The central role of science and technology in addressing these and other international issues makes its application and its protagonists central to efforts to link countries and societies. Over the past year, the AAAS Center for Science Diplomacy has brought together the science, foreign policy and public policy communities to identify areas where science cooperation can help build relationships and the actions that might assist in such efforts. We have worked to build links with governments and non-governmental institutions around the world to highlight the power of science in addressing issues of mutual interest and benefit. And, we have worked with others to help provide the knowledge and background needed to better take advantage of science as one instrument of relationship building. The Center's efforts are informed and inspired by the historical examples of science serving as a bridge to understanding, including during a time when governments and societies were trying to rebuild connections after the last devastating world war and a period when they were trying to keep some form of dialogue during the depths of a Cold War.

As we look forward to the Center's second year, we are excited about the prospects of increasing our efforts to provide a firm intellectual foundation for science diplomacy while increasing the numbers of partners with whom we work. In addition, we look forward to further demonstrations of the powerful connecting power of science cooperation through additional delegation visits and public events that bring together the growing numbers of stakeholders in this endeavour.

In all of these efforts, we have benefited from the generous support of organizations such as the Lounsbery Foundation and the Golden Family Foundation as we developed and hosted programs, and put science diplomacy into action through visits and international conferences.

— Vaughan Turekian, Ph.D.

Director, AAAS Center for Science Diplomacy

AAAS Chief International Officer

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AAAS Center for Science Diplomacy: History and Mission

International scientific cooperation advances both science and the broader relationships among partner countries. Such cooperation serves an important role in initiating relationships, building trust, and expanding understanding between countries and societies. Past examples of science diplomacy efforts include high-profile and productive engagements between U.S. and Soviet scientists throughout the 1970's and 80's as well as science engagement with the People's Republic of China before official diplomatic ties were fully established. Today, science and technology agreements form the backbone of many efforts to incorporate science into the broader diplomatic relationships between and among countries.

While governments have an important role in facilitating science diplomacy, civil society—including scientists—participation is essential in this diplomacy of deeds. In order to promote and support the role of science and scientists as bridge builders and to raise the profile in both the foreign policy and scientific communities, AAAS established its Center for Science Diplomacy on July 15, 2008.

The Center is guided by the over-arching goal of using science and scientific cooperation to promote international understanding and prosperity. It approaches this goal by providing a forum for scientists, policy analysts, and policy-makers through which they can share information and explore collaborative opportunities. We are particularly interested in identifying opportunities for science diplomacy to serve as a catalyst between societies where official relations might be limited, and to strengthen civil society interactions through partnerships in science and technology.

The Center's core activities are built on three key theme areas:

Inspirational: Raising the profile of science diplomacy as an important element of a broader foreign policy mix by convening events and activities and building a community of stakeholders for science diplomacy activities;

Operational: Assembling delegations and bilateral activities to put science diplomacy into action;

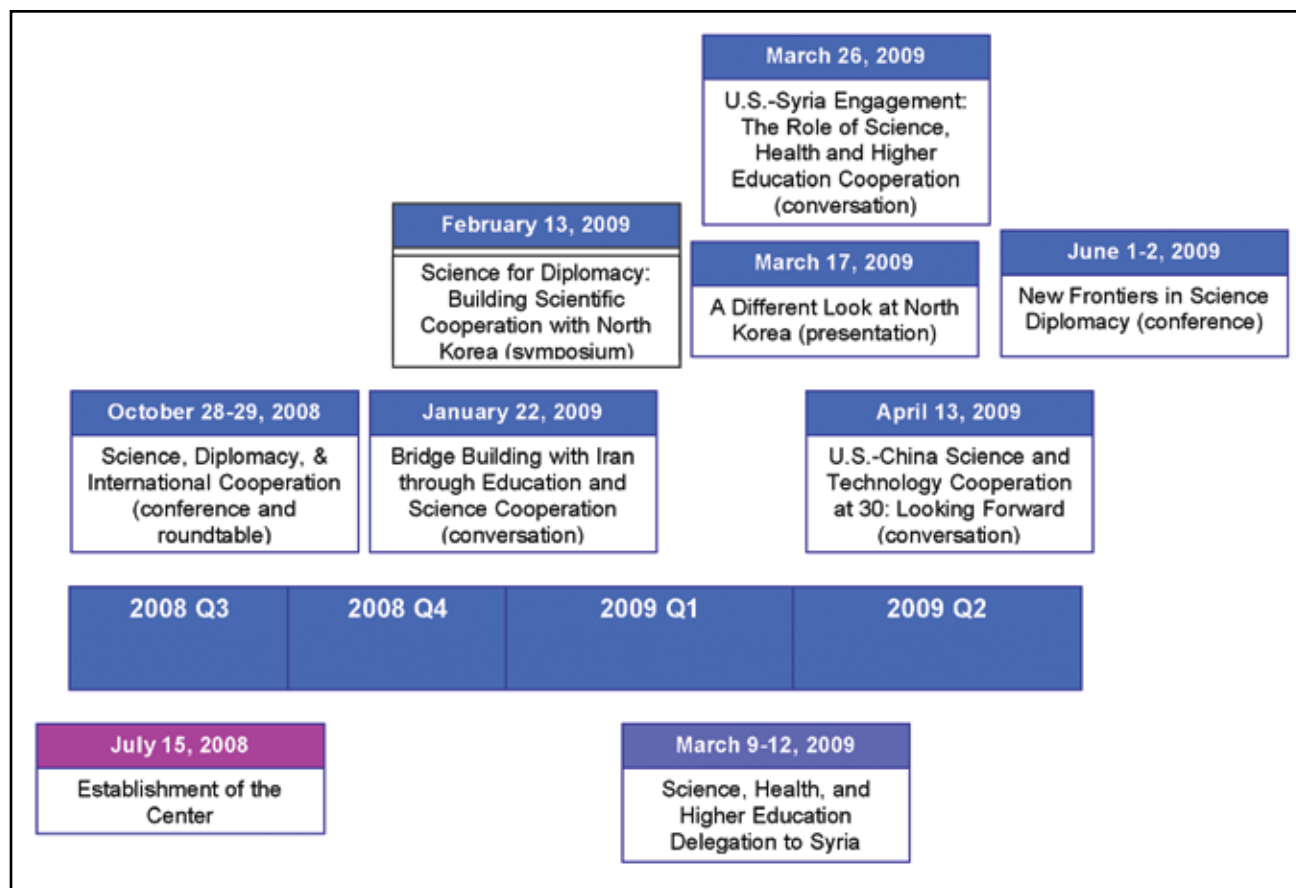
Intellectual: Creating a foundation of literature and think pieces that identify and define key issues in science diplomacy and possible best practices in devising and implementing science diplomacy strategies.

The Center's specific actions will include:

- Analyze current and past domestic and international science diplomacy efforts and derive lessons learned from those that have succeeded;
- Characterize the major barriers to successful science diplomacy, such as educational and human resource issues, funding problems, or other policy issues; and
- Leverage existing and build new partnerships with appropriate stakeholders in both the scientific and the international affairs communities to develop new initiatives and projects and expand ongoing successful ones.

The Center is grateful for the financial support of the Golden Family Foundation and the Richard Lounsbery Foundation.

Activities: July 2008 – June 2009



July 2008-June 2009 Center for Science Diplomacy activities and events.

“The Role of Non-Governmental Organizations and Universities in International Science and Technology Cooperation,” a hearing of the U.S. House of Representatives Committee on Science and Technology Subcommittee on Research and Science Education. (July 15, 2008)

The hearing examined the role of U.S. non-governmental organizations and universities in international science and technology cooperation, in particular relative to the role of the Federal government. During his testimony, AAAS Chief Executive Officer, Dr. Alan Leshner, announced the creation of the Center for Science Diplomacy. Other witnesses included Dr. Michael Clegg, Foreign Secretary of the U.S. National Academy of Sciences; Dr. William Wulf, Member of the Board of Directors of the Civilian Research and Development Foundation (CRDF); and Dr. James Calvin, Interim Vice President for Research at Texas A&M University.

Link: http://science.house.gov/publications/hearings_markup_details.aspx?NewsID=2259

“Science, Diplomacy, and International Cooperation,” conference and roundtable (October 28-29, 2008)



U.S. Representative Dr. Brian Baird

The Center kicked off its inaugural efforts with a two-day conference and roundtable that brought together stakeholders from science organizations, universities, foundations, and the foreign policy community to address the application of international science and technology and education cooperation in supporting international relations and the development of broader activities and initiatives to increase U.S. engagement with the world. The first day conference addressed a broad audience interested in the topic, with sessions focused on: foreign policy perspectives on science diplomacy; role of universities; and science organizations as network points. The conference was opened by the then Chair of the U.S. House of Representatives Science Subcommittee on Research and Science Education, the Honorable Dr. Brian Baird, and the Vice Chair of the Science Subcommittee, the Honorable Russ Carnahan, who was also the Vice Chair of the House Foreign Affairs Subcommittee on International Organizations, Human Rights and Oversight. The Honorable John Hamre, President and CEO of CSIS, closed the conference.

The second day featured an invitation-only roundtable with leaders from the scientific, foreign policy, and philanthropic communities to develop an actionable framework for advancing science and technology and education cooperation in formal U.S. diplomatic relations and unofficial people-to-people relations.

Link: http://diplomacy.aaas.org/events/event_ScienceDiplomacyInternationalCooperation.shtml

“Bridge Building with Iran through Education and Science Cooperation,” conversation (January 22, 2009)

The conversation, co-sponsored with the U.S. Institute of Peace (USIP), provided a read-out of the Association of American Universities (AAU)-organized tour of Iran in November 2008 for the presidents of six leading U.S. universities, part of a series of exchange visits involving senior academics and scientists to identify potential ways for enhancing scientific and educational links between the United States and Iran. The conversation was moderated by Ambassador Francis Ricciardone, then a Guest Scholar with USIP (since March 2009, the Deputy U.S. Ambassador to Afghanistan) and former U.S. Ambassador to Egypt, the Republic of the Philippines and the Republic of Palau, and featured panelists including Dr. Shiva Balaghi, an independent scholar; Dr. Robert Berdahl, President of AAU; and Glenn Schweitzer, Director of Eurasian Programs at the U.S. National Academies. The panelists offered some insight into potential areas where science and education cooperation might provide one approach for increasing engagement between the two countries. And they reviewed events, including the recent detention of a member of a U.S. National Academy of Sciences’ delegation, that have the potential to impact future scientific collaborations.

Link: http://diplomacy.aaas.org/events/event_IranCooperation.shtml

“Science for Diplomacy: Building Scientific Cooperation with North Korea,” symposium at the 2009 AAAS Annual Meeting in Chicago (February 13, 2009)

The symposium, co-organized by the Center and the U.S. Civilian Research and Development Foundation (CRDF), explored the challenges and opportunities of U.S.-Democratic People’s Republic of Korea (DPRK) scientific engagement. The panelists consisted of members of the U.S. Consortium for DPRK Scientific Engagement, AAAS, The Korea Society, Syracuse University, and CRDF, which was formed in May 2007. Each consortium member addressed different areas of scientific engagement, including student exchanges, cooperation between scientific communities, specific areas for advancing scientific collaborations, and why science is a useful tool of engagement.

Link: http://diplomacy.aaas.org/events/event_NorthKorea.shtml



Science, Health, and Higher Education leaders from Syria and the United States gather in Damascus for the first day of meetings. Photo courtesy of Damascus University

Science, Health, and Higher Education Delegation to Syria (March 9-12, 2009)

AAAS and the Center for Science Diplomacy participated in a 10-member U.S. delegation of high-level science, medical and higher education officials that visited Syria for four days of meetings to explore cooperation in health, agriculture, scholar exchanges, and other areas. The delegation included AAAS's immediate past Chairman of the Board, Dr. David Baltimore (a Nobel Laureate) and the Center's executives. During the visit, the delegation also met for more than an hour with Syrian President Bashar al-Assad.

Link: <http://www.aaas.org/news/releases/2009/0326syria.shtml>

"A Different Look at North Korea," presentation (March 17, 2009)

Dr. Robert E. Springs, Jr., Founding CEO & President of Global Resource Services, presented his experiences traveling and working in North Korea over the past eleven years.

His mission of humanitarian and development assistance in connection with governments, the UN and NGOs, seeks to develop diversified approaches to U.S.-North Korea relationships. The presentation was co-sponsored with the AAAS Center for Science, Technology and Security Policy and the National Committee on North Korea.

Link: http://diplomacy.aaas.org/events/event_NorthKorea2.shtml

"U.S. – Syria Engagement: The Role of Science, Health and Higher Education Cooperation," conversation (March 26, 2009)

The conversation discussed the recent visit by a high-level U.S. delegation on science, health and higher education to Syria and potential broader implications for building sustainable relationships between the United States and Syria, particularly in the context of recent increased expectations that the political relations between the two countries might be thawing. The panelists consisted of some members of the U.S. delegation: Ambassador Theodore Kattouf, President of AMIDEAST and former U.S. Ambassador to Syria and UAE; Dr. Norman Neureiter, Senior Adviser of the AAAS Center for Science Diplomacy; Max Angerholzer, Executive Director of the Richard Lounsbery Foundation; and Dr. Vaughan Turekian, AAAS Chief International Officer and Director of the AAAS Center for Science Diplomacy.

Link: http://diplomacy.aaas.org/events/event_Syria.shtml

“U.S.-China Science and Technology Cooperation at 30: Looking Forward,” conversation (April 13, 2009)



Cao Jianlin

On the occasion of the 30th anniversary year of the signing of the umbrella science and technology agreement, one of the first acts of normalization, between the United States and the People’s Republic of China, a panel discussed the role of, mechanisms for, and challenges to cooperation in science and technology between the two countries over the coming decades. The conversation was opened by China’s Vice Minister of Science and Technology, Dr. Jianlin Cao, and the panelists included Dr. William Colglazier, Executive Officer of the U.S. National Academy of Sciences and Chief Operating Officer of the National Research Council; John J. Norris, Jr., U.S. Deputy Assistant Secretary of State for East Asian and Pacific Affairs; Dr. Eugene Skolnikoff, Professor of Political Science Emeritus at MIT; and Dr. Norman P. Neureiter, Senior Adviser in the AAAS Center for Science Diplomacy and former Science Adviser to the U.S. Secretary of State.

Link: http://diplomacy.aaas.org/events/event_Chinao41309.shtml

“New Frontiers in Science Diplomacy,” conference (June 1-2, 2009)

The two-day conference, hosted by and co-sponsored with the Royal Society in London, brought together experts from the UK and international scientific and foreign policy communities to examine the role of science in foreign policy. The first day discussed various international perspectives on the meaning, value and tools of science diplomacy, as well as identifying barriers to science diplomacy and how they may be overcome. The second day then examined the role of science in achieving two key foreign policy goals: maintaining international peace and security, and promoting economic and social development and well being. The conference program was organized by Professor Lorna Casselton FRS (Royal Society), Professor Mohamed Hassan (Academy of Sciences for the Developing World), Dr. Raghunath Mashelkar FRS (National Chemical Laboratory), Dr. Jim McQuaid FEng (University of Sheffield), Dr. Vaughan Turekian (AAAS), and Professor Anthony Cheetham FRS (University of Cambridge).

Link: http://diplomacy.aaas.org/events/event_Londono6o109.shtml

Looking Forward

- Continuing activities on raising awareness for science diplomacy, including convening a discussion series in the Fall/Winter 2009/2010 on regional integration and international science cooperation, a session at the World Science Forum in Budapest in November 2009
- Expanding the delegation visits to countries like Cuba and Myanmar to develop relationships for exchanging ideas on cooperation
- Initiating studies on best practices and lessons learned for science diplomacy

Science and Diplomacy: A Conceptual Framework

The relationship between science and diplomacy can be articulated as three concepts that depend on the goals of the relationship – diplomacy for science; science in diplomacy; and science for diplomacy (or simply “science diplomacy”). Within this framework, science is considered in its broadest sense to encompass not only scientific research but also the whole range of international scientific cooperation activities including education and capacity building and the people involved in the enterprise. Diplomacy is also considered broadly to include both informal (i.e., people-to-people) and formal (governmental) relationship-building between the countries. Moreover, science for the purpose of achieving development goals sits outside this framework.

Diplomacy for science. Diplomacy is a mechanism for advancing a scientific goal, particularly extensive and expensive research programs that need to leverage the participation of multiple countries. Examples include:

- International Thermonuclear Experimental Reactor
- European Organization for Nuclear Research (CERN)
- FutureGen

Science in diplomacy. Science is necessary for the conduct of diplomacy or informs issues of diplomatic concern. This includes the capacity of diplomats and diplomacy institutions to understand scientific and technical knowledge as related to bilateral and multilateral issues such as cross-border public health and food safety. Examples include:

- Arms control agreements (Anti-Ballistic Missile Treaty, Comprehensive Test Ban Treaty)
- International environmental agreements (Montreal Protocol on Substances That Deplete the Ozone Layer, Framework Convention on Climate Change)
- Capacity building within the U.S. Department of State through the creation of the Science Adviser to the Secretary of State position

Science for diplomacy (or science diplomacy). Science is a mechanism for enhancing or building bridges between countries (i.e., diplomatic purposes). Science diplomacy is especially relevant in helping develop positive engagement between countries that have strained, limited, or non-existent relationships. Examples include:

- Cooperation between American and Soviet atomic scientists during the Cold War
- Enhanced scientific cooperation between the United States and Japan in the 1960’s, including the establishment of the Tokyo NSF office
- U.S.-China umbrella S&T agreement signed by President Carter and Vice Premier Deng in 1979 following establishment of formal diplomatic relations

Any particular international science cooperation activity (e.g., capacity-building, joint research projects, science student fellowships, scientific conferences, faculty exchanges with developing country universities) can be described by one or more of these concepts. For example, CERN exemplifies both a case where diplomacy was utilized to build European physics and where the physics brought together former World War II antagonists in a process of post-conflict European integration.

Appendix II

Written Testimony Before the Committee on Science and Technology Subcommittee on Research and Science Education

by Alan I. Leshner, Ph.D.

Chief Executive Officer

American Association for the Advancement of Science

Executive Publisher, *Science*

July 15, 2008

Dr. Baird (chairman), Dr. Ehlers (ranking member), members of the Subcommittee, thank you for the opportunity to testify on the critical role that U.S. non-governmental organizations play in cultivating, promoting, and coordinating international science and technology cooperation.

The American Association for the Advancement of Science (AAAS) is the world's largest multidisciplinary scientific society and publisher of the journal, *Science*. Although we were founded in the United States and our name begins with the word "American", that term belies the inherent role that we play in the international arena. Approximately 20 percent of our members are from outside the United States. Moreover, 35 to 40 percent of the research articles we publish in *Science* have authors located outside of the United States. As the largest general scientific society in the world, our membership allows us both to draw upon scientists from around the world and to access scientists from a very wide range of fields, including the natural, physical and social sciences, as well as engineering and medical science. This depth and breadth of membership provides a massive resource base for action. AAAS also has an array of well established and recognized program activities in science education, science policy, science communication, and science and national security. This diversity allows us to engage stakeholders from all regions and sectors required to promote and sustain a robust dialogue with the global scientific community.

Over the years, AAAS has worked hard to broaden its efforts to advance science internationally through a range of meetings and education exchange activities. AAAS's portfolio of programs, publications and members are critical to our efforts to build coalitions among other science organizations, non-governmental organizations (NGOs) and international governments for addressing a wide range of science-society issues and for providing a framework for our broader international efforts. As a AAAS Board of Directors' resolution states, "science is often a means to bridge the political chasm that divides nations." It is a sentiment that is embodied in all of AAAS's international interests and is echoed in our Mission "to advance science and serve society throughout the world."

AAAS International Goals and Missions

While AAAS's international activities typically involve convening special workshops or fostering educational exchanges, our projects can best be characterized as supporting two key and mutually reinforcing objectives:

- Helping to build and knit together the global science enterprise
- Promoting what is called science diplomacy

Building a Global Science Enterprise

Science is by definition global in scope and application - it knows no borders, is not constrained by geography, and no one country has a monopoly on it. Advancements in astronomy, mathematics, biology and medicine can find their roots in a rich history of scientific inquiry, discovery, and the sharing of knowledge whether from Meso-America, the Middle-East, or Europe.

That said, the United States has invested in a rich portfolio of basic and applied research across a diverse spectrum of disciplines, established a higher education system that is envied around the world, and developed a robust scientific infrastructure. Because of these investments, our national science and technology activities are at the very forefront of the world's scientific enterprise. These investments have also greatly benefited human health and well-being, increased standards of living and economic growth, and helped build an informed democratic society.

Because of our international character, we at AAAS believe it is both our mission and a great opportunity to build international partnerships that assist other nations as they begin to become integrated into the global science enterprise. In support of our objective "to serve society," we help developing nations establish the requisite scientific infrastructure in order that they too may better reap the benefits of science as a basis for both their own scientific advancement and their economic and social development.

Two recent examples of such international efforts include:

Women Leaders in Science and Engineering Conference. AAAS worked in collaboration with the U.S. Department of State and the Government of Kuwait to organize the Women's Leaders in Science and Engineering Conference in Kuwait City in 2007. AAAS was able to assemble a delegation of U.S. women scientists and engineers along with nearly 200 female scientists representing the 22 Arab countries. The conference allowed international scientific peers to share experiences and lessons learned in mentoring, scientific publishing and academic leadership. Beyond building practical skills, the conference also provided a critical opportunity for networking and building relationships for potential collaborations in the future; not only between the U.S. and Arab nations, but among the Arab nations present.

Research Integrity Workshop in China. Last September, AAAS conducted a workshop in collaboration with senior members of the Chinese scientific research and policy community on the subject of research integrity and misconduct. The assembled U.S. delegation included journal editors, former university presidents, and government officials. Chinese delegates include presidents of their universities and leaders of government agencies with responsibilities for science and technology. Because integrity and trust are so critical to scientific research and collaboration, this type of dialogue provided a valuable framework for future partnerships and the further development of China's own standards for the ethical conduct of scientific research.

Science Diplomacy

AAAS's second major objective is to act as a catalyst for what is called "science diplomacy." The overarching goal of science diplomacy is to use international scientific cooperation to foster communication and cooperation among the peoples of diverse nations and to promote greater global peace, prosperity and stability. Science diplomacy is receiving more and more attention in both the scientific and international relations community.

It might be useful here to draw a somewhat subtle distinction between science diplomacy as conducted by governments and science diplomacy as carried out by non-governmental organizations. As emphasized in a recent Congressional Research Service Report to the Congress¹, science and technology can be used very effectively by government agencies as a diplomatic or foreign policy tool either to help foster another country's development or to increase understanding of U.S. values and ways of doing business. As used by nongovernmental organizations, science diplomacy has typically been used to maintain communication and cooperation links among the citizens of countries when their governmental relationships might otherwise be strained or limited². In addition, non-governmental science diplomacy can help build relationships among civil society entities to foster closer people to people relationships whether governmental relationships are good or strained. From my point of view, governments should be interested and supportive of all of these forms of science diplomacy.

¹ Stine, D.D., "Science, Technology, and American diplomacy: Background and Issues for Congress", Congressional Research Service, May 22, 2008.

² Lord K.M. and Turekian V.C., "Time for a New Era of Science Diplomacy", Science, February 9, 2007: Vol. 315 no. 5813, pp. 769 - 770.

Perhaps the most well known example of the success of science diplomacy is the scientific exchanges that took place between the U.S. and the former Soviet Union throughout the Cold War years. These engagements not only helped advance fundamental scientific research, but they also were critical for reinforcing trust between two nations with tense official relationships. In fact in many instances, it provided the only relationship between the two. AAAS believes this use of scientific collaboration and communication is essential both to the advancement of science and its use for the benefit of our global society. For these reasons I am very pleased to announce today the creation of a new AAAS Center for Science Diplomacy.

The Center is to be guided by the over-arching goal of using science and scientific cooperation to promote international understanding and prosperity. It approaches this goal by providing a forum for scientists, policy analysts and policymakers through which they can share information and explore collaborative opportunities. We are particularly interested in identifying opportunities for science diplomacy to serve as a catalyst between societies where official relations might be limited, and to strengthen existing partnerships in science and technology.

The Center's initial activities will focus on:

- Analyzing current and past domestic and international science diplomacy efforts and deriving lessons learned from those that have succeeded;
- Characterizing the major barriers to successful science diplomacy, such as educational and human resource issues, funding problems, or other policy issues; and
- Leveraging existing and building new partnerships with appropriate stakeholders in both the scientific and the international affairs communities to develop new initiatives and projects and expand ongoing successful ones.

Constraints on AAAS Programs

AAAS faces the same dilemmas that the U.S. government faces: how best to balance domestic versus international interests, and how best to balance short-term versus long-term goals. International cooperation takes time to develop and nurture, particularly if it requires infrastructure development in one of the cooperating countries. The impacts of science diplomacy also can take a long time to be realized, since the scientific work must be done and trust must be nurtured over time.

Both collaboration and diplomacy require clear time commitments, and we are limited by the ability of our scientific members to take time from their own research careers to share their expertise and build the necessary relationships. We are fortunate at AAAS, because we can draw upon a very large membership of notable scientists that have both an eager interest in and the necessary experience of working internationally. But that is not always enough. Many large scientific organizations, not only those represented here today - CRDF, AAAS, and the Academy – assist scientists in some capacity to participate in the range of international activities that our organizations sponsor. By collaborating and supporting one another, our organizations are able to maximize the quality of international endeavors, while minimizing the resources required.

Some Potential Government Activities

I will conclude by identifying some possible steps the government might consider in order to better position the United States in undertaking international science activities. First, we need more efforts like this hearing to raise the profile of these issues, to the government, to the public and to the scientific community. I hope that other committees, particularly those dealing with foreign relations, will work jointly with the Research and Science Education Subcommittee to continue the discussion of the importance of international scientific cooperation and science diplomacy as tools in facilitating international peace, prosperity and security, and build upon the efforts that you have already launched.

An example of a topic that could be explored in a joint hearing might be mechanisms to assist the State Department in the development of better strategies for evaluating science and technology cooperation agreements. Too often the signing of these agreements seems to be an end to the process rather than the start of a long-term, strategic relationship.

Moreover, an analysis could be undertaken jointly by the scientific community and the international relations community to provide guidance for more strategic use of these agreements. This guidance could serve not only to help foster international scientific collaborations and overall relationship building, but also for addressing the many societal challenges we face, such as sustainability, climate change, health, etc.

I also believe there are steps that might improve the effectiveness of the international programs of U.S. governmental research agencies. One concern is that some agencies may be limited by statute in their ability to use federal funds to support international activities because they are not allowed to pay the costs for foreign participants. Many agencies, of course, do participate in joint international projects (e.g., the Space Station), but many still are unable to use their budgets to help pay any of the costs for foreign participation. Although we do agree with the view that U.S. taxpayer funds should be used primarily to support American science, there are instances, such as in international science development activities, where this limitation impedes the ability of the programs to achieve their goals. Specifically, many countries simply cannot afford to support their side of the collaboration, and therefore the collaboration is doomed before it has begun. It is worth noting that the European Commission 7th Framework Program includes a new policy that allows non-European institutions to apply for research funding.

In the realm of science diplomacy, I would encourage Congress and the State Department to organize a workshop or roundtable of relevant stakeholders from the scientific and international affairs communities to look at ongoing efforts and analyze the possibility of establishing new funding mechanisms to catalyze the types of international science cooperation that are consistent with and reinforce the foreign policy objectives of the United States.

Finally, I believe that any efforts to raise the profile and effectiveness of international science require strong White House leadership, mostly likely through a Presidential Science Advisor with sufficient rank to work across the government, most likely the rank of Assistant to the President. Furthermore, the Office of Science and Technology Policy must also have an associate director who has a clear international mandate and the ability to work with the State Department and the National Security Council on issues of international science cooperation.

As science and technology are ever-more imbedded in every aspect of modern life and in every major global policy issue, it is essential that that all relevant parties — the Executive Branch, Congress, scientific organizations and their members, international think tanks, foundation leaders, and others, work together in a deliberative manner to determine ways and places where science and technology cooperation might be better incorporated into international relations, not only government to government, but critically, civil society to civil society.

The Science of Diplomacy³

by Vaughan Turekian and Kristin M. Lord

Last week, U.S. President Barack Obama announced his 20-person Council of Advisors on Science and Technology, a group including two Nobel laureates. He also proclaimed his intention to increase scientific research spending to 3 percent of GDP, \$70 billion more per year. The news prolonged Obama's honeymoon with U.S. scientists, spurred by his senior-level appointments of highly respected specialists such as Dr. John Holdren and Dr. Steven Chu as well as his re-legalization of stem cell research in his first days in office.

As he re-commits resources to this most important field, Obama must remember that science and technology have tremendous applications in and effects on the world of foreign policy as well. Given the United States' predominance in technology, engineering, health, and innovation, other countries want to engage with and benefit from the United States' ideas and products. Still, past U.S. governments have not taken full advantage of the power and potential of science to improve foreign affairs and make a safer, healthier world. To engage in science diplomacy — defined here as scientific cooperation and engagement with the explicit intent of building positive relationships with foreign governments and societies — Obama should do the following.

Think strategically. Scientific cooperation can be a fruitful and apolitical way to engage countries where diplomatic relations are strained. For example, the U.S. National Academy of Sciences has sponsored scientific exchanges with Iran for the last several years. As part of these exchanges, young Iranians enthusiastically welcome visits from U.S. thinkers like Nobel laureate in physics Joseph Taylor. Scientists work together on issues of mutual interest such as public health and earthquake preparedness. A nascent effort at science diplomacy is now underway in Syria, which recently welcomed a high-level visit of U.S. scientists and educators. The delegation met for over an hour with President Bashar al-Assad, himself a medical doctor, to discuss potential areas of cooperation outside the realm of politics.

Think offensively as well as defensively. Current policies regarding international cooperation often restrict access to U.S. technologies — keeping nuclear weapons out of the hands of terrorists, for instance. But such defensive policies should be matched with better offensive policies: bringing the world's best scientists and scientific businesses into the United States and sending American scientists out to aid the world more often.

To this end, the United States should provide visas and scholarships to usher talented students into American universities and dramatically increase the number of H-1B visas, which admit specialized workers such as doctors and physicists. The United States should also send more professionals to aid in conducting disease surveillance, developing clean energy technologies, facilitating environmental adaptation, and providing early warning of impending natural disasters.

Think about people — not just governments. Foreign publics admire American science and technology far more than they admire America. Indeed, an analysis of Pew polling data from 43 countries shows that favorable views of American science and technology exceed overall views of the United States by an average of 23 points. This presents the United States with a public diplomacy opportunity: to remind foreign people of what they like about the United States and to highlight constructive partnerships between Americans and foreign scientists, engineers, doctors, and technology business leaders.

As a first step, the U.S. government should publicize successful partnerships with other countries and the relevant accomplishments of Americans. This means trumpeting Bill Gates as much as government officials and naming Nobel laureates like Egyptian-American chemist Ahmed Zewail as goodwill ambassadors. It means exposing the thousands of U.S.-government-sponsored scientific visitors to American society and politics, not just science.

Facing a complex set of foreign-policy challenges, the United States can no longer afford to overlook such a useful instrument of statecraft. Importantly, the Obama administration must change current approaches. Foreign-policy leaders — especially Secretary of State Hillary Clinton — must recognize the power of this means of engagement. The United States has emphasized in past weeks its commitment to the globally shared goals of healthier populations, a cleaner environment, safer societies, and a better life for all. Recognizing the potential of science diplomacy will certainly help maximize the United States' realization of these goals.

³ *Foreign Policy*, May 2009 (web exclusive)

U.S.-China S&T at 30⁴

by Norman P. Neureiter and Tom C. Wang

In 1972, The Shanghai Communique of President Nixon and Chinese Premier Zhou Enlai ended 23 years of isolation between the United States and China. Tucked into a single sentence was a brief reference to cooperation in science and technology (S&T). Visits by scientists and scholars then gradually increased, guided on the U.S. side by the nongovernmental National Academy of Sciences. Six years later, and presaging formal diplomatic relations in 1979, came the breakthrough science diplomacy mission of the President's Science Advisor Frank Press, accompanied by representatives of nearly every technical federal agency. That trip laid the groundwork for the formal Agreement on Cooperation in S&T, signed exactly 30 years ago this week by President Carter and the Chinese leader Deng Xiaoping.

The new U.S. president firmly believes in the power of science to address domestic and global challenges, making this 30th anniversary year an excellent time to assess the U.S.-China S&T relationship and ensure that it is on the right track for the future. These ties have come a long way. Over a million Chinese students have studied at U.S. universities, some two-thirds of them in S&T. Many have stayed, and today about 8% of science and engineering Ph.D.s in the United States were born in China.⁵ In recent years, almost 40% of Chinese science and engineering articles in international journals have had U.S. coauthors, and almost 8% of U.S. international papers have had Chinese coauthors. In 2004, \$622 million of China's total R&D was performed by U.S.-owned companies and affiliates in China. With the exception of one area—space exploration—research cooperation between universities as well as government labs is broad and diverse. Furthermore, China has declared that its path to the future will be driven largely by S&T, and it is making the needed commitments to education, facilities, and research.⁶

However, the overall relationship with China is not without tensions. The massive U.S. trade deficit is equated with the loss of U.S. jobs, the alleged manipulation of currency exchange rates, and concerns over U.S. competitiveness. China's economic boom and soaring demand for resources (now easing) could be a source of future conflict. Taiwan remains an area of potential confrontation. And China's increasing investment in its military has raised concerns, being used in the United States to justify more investment in new weapons and defense systems. China is also in a special category for U.S. visas and export controls, due to a controversial 1999 U.S. congressional report charging China with espionage in nuclear and missile technologies. Despite being America's principal creditor, the Chinese have concerns about U.S. long-term intentions toward Asia and their country. There is a level of mistrust on both sides.

Science provides a common language that can help bridge cultures and serve to lessen mistrust and increase transparency. The Obama administration should work to raise S&T cooperation with China to a new level of partnership. The existing Joint S&T Commission, chaired by the President's Science Advisor and China's S&T minister, should meet annually (instead of every 2 years), and the 2009 meeting should lay out a 10-year plan of cooperative research focused on global challenges faced by both countries, including climate change, energy, food, health, and security. On the U.S. side, new funds will be needed to complement the agencies' domestic programs in these areas. The United States must also ensure that all qualified Chinese (and other foreign) scientists can obtain visas on a timely basis, and that our export controls protect national security but do not prevent U.S. corporations from fully participating in the global civil economy.⁷ The United States and China must be true partners in seeking technical solutions that will support a global population of some nine billion people by 2050. Such cooperation can also mitigate inevitable tensions in the overall relationship—both splendid goals for the next 30 years.

⁴ *Science* 30 January 2009: Vol. 323, no. 5914, p. 561.

⁵ National Science Board Science and Engineering Indicators 2008.

⁶ Wen Jiabao, *Science* 322, 649 (2008).

⁷ See *Beyond "Fortress America"* (National Academies Press, Washington, DC, 2009).

Appendix III

Staff

Director

Vaughan C. Turekian, Ph.D.

Dr. Vaughan Turekian is the director of the Center, and he is also the Chief International Officer of the American Association for the Advancement of Science (AAAS). In this role, he coordinates the broad range of AAAS's international activities and reaches out to the international science community. Prior to this position, Dr. Turekian served as Special Assistant to the Undersecretary of State for Democracy and Global Affairs in the U.S. Department of State, advising on a broad range of international science, technology, environment and health issues, including clean energy, sustainable development, climate change, scientific outreach, and avian influenza. Before joining the State Department, he worked on the Committee on Global Change Research and the Board on Atmospheric Sciences at the U.S. National Academy of Sciences (NAS). In 2001, he served as the NAS Study Director for the White House-requested report on climate change science. He is also a Nonresident Fellow at the Brookings Institution and a Term Member of the Council on Foreign Relations. Dr. Turekian received his master's and doctorate degrees in environmental sciences from the University of Virginia, where he focused on applying stable isotopic tracers to characterize aerosol sources and chemistry in the marine boundary layer. He is a graduate of Yale College with degrees in Geology and Geophysics and International Studies.

Senior Adviser

Norman P. Neureiter, Ph.D.

Norman P. Neureiter was born in Illinois and grew up near Rochester, New York. He received a B.A. degree in chemistry from the University of Rochester in 1952 and a Ph.D. in organic chemistry from Northwestern University in 1957. He spent a year ('55-6) as a Fulbright Fellow in the Institute of Organic Chemistry at the University of Munich.

In 1957, he joined Humble Oil and Refining (now part of Exxon) in Baytown, Texas as a research chemist, also teaching German and Russian at the University of Houston. On leave from Humble in 1959, he served as a guide at the U.S. National Exhibition in Moscow, subsequently qualifying as an escort interpreter for the Department of State. In 1963, he joined the International Affairs Office of the U.S. National Science Foundation in Washington and managed the newly established U.S.-Japan Cooperative Science Program. Entering the U.S. Foreign Service in 1965, he was named Deputy Scientific Attache at the U.S. Embassy in Bonn. In 1967, he was transferred to Warsaw as the first U.S. Scientific Attache in Eastern Europe with responsibility for Poland, Hungary and Czechoslovakia.

Dr. Neureiter returned to Washington in 1969 as Assistant for International Affairs to the President's Science Advisor in the White House Office of Science and Technology. He left the Government in 1973 and joined Texas Instruments (TI), where he held a number of staff and management positions including Manager, East-West Business Development; Manager, TI Europe Division; Vice President, Corporate Staff; and Vice President of TI Asia, resident in Tokyo from 1989-94.

After retirement from TI in 1996, he worked as a consultant until being appointed in September 2000 as the first Science and Technology Adviser to the U.S. Secretary of State. Finishing the 3-year assignment in 2003, he was made a Distinguished Presidential Fellow for International Affairs at the U.S. National Academy of Sciences. In May 2004, he joined the American Association for the Advancement of Science (AAAS) as the first Director of the new AAAS Center for Science, Technology and Security Policy (CSTSP), funded by the MacArthur Foundation. Dr. Neureiter is married with four children and speaks German, Russian, Polish, French, Spanish and Japanese.

Dr. Neureiter was named 14 January 2008 to receive the Public Welfare Medal, the highest honor of the National Academy of Sciences.

Deputy Director

Tom C. Wang, Ph.D.

Dr. Tom Wang is deputy director of the Center and also serves as the director for international cooperation in the International Office of AAAS, where he helps to manage the association's bilateral and multilateral international relationships. Dr. Wang came to AAAS from the U.S. Department of State, where he was an AAAS Science & Technology Policy Fellow serving as a science policy advisor in the Bureau of East Asian and Pacific Affairs. He was the Bureau's primary contact and coordinator for environment, science, technology, and health issues relevant to the region. He represented the U.S. government in the 21-economy Asia-Pacific Economic Cooperation (APEC) forum's science, technology, and health-related working groups and led the Bureau's efforts in addressing pandemic influenza. Prior to federal government service, Dr. Wang conducted drug delivery research at Johnson & Johnson. He has also consulted for various technology companies including Alkermes, GE Plastics, Hewlett-Packard, and Omni-Guide Communications. Dr. Wang's scientific expertise is in the area of polymeric materials and nanotechnology and he received his master's and doctorate degrees in chemical engineering from the Massachusetts Institute of Technology. He is a graduate of the University of California at Berkeley with degrees in chemical engineering and political science.

Program Associate (starting August 2009)

Stephanie Pals

Stephanie Pals is the program associate in the Center. Ms. Pals came to AAAS from the American Society of Engineering Education (ASEE), where she was the International Programs Associate and previously the Public Affairs Coordinator. She holds a Master of Arts in International Science and Technology Policy from the George Washington University, Elliott School of International Affairs, and received a Bachelor of Science in Society, Technology, and Policy from Worcester Polytechnic University.



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