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Science and Technology Advising in Today's Foreign Policy

Vaughan Turekian and Teruo Kishi

IN an era when science and technology underpin solutions to the growing list of bilateral, regional, and global issues confronting our foreign policy leadership, we are working to ensure that our ministries and leaders have access to the best possible data and information to inform policies.

The United States, Japan, and other countries are taking important steps to integrate science and technology into foreign policy decision making, but more attention and progress are needed if the international community is to effectively address the complex and multisectoral challenges of today and the future. Durably integrating science, technology, and innovation (STI) into the foreign policy enterprise involves more than having scientific and technical experts provide professional knowledge at the foreign policy table, though such input is important; it also entails applying how scientists and engineers fundamentally think about and solve problems—the scientific method itself—as a potentially powerful approach to addressing urgent foreign policy challenges. Using the scientific method, we can take observations and data from today and develop and test hypotheses for possible events in the future. In this manner, policymakers can begin to predict areas where future policies will have an impact, rather than simply reacting to the constant changes in the world.

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In the past year alone, we have witnessed countless examples of science and technology entering the realm of foreign policy. Tragically, thousands of babies born with microcephaly linked to infections caused by the Zika virus in the Western Hemisphere challenged us to collectively understand this emerging threat and respond globally. Synthetic biology and gene-editing technologies continue to figure in discussions on trade, agriculture, and health. Robots serve as companions and assist aging societies, while machine learning and artificial intelligence touch every sector from healthcare to manufacturing to disaster preparedness and response. Innovations in the digitization of money are changing the financial sector.

Such cases make clear, then, that many of our most pressing foreign policy questions involve major science and technology elements. Moreover, timely STI issues such as global health security are central to the agendas of many multilateral fora, including those of the G7, G20, and the forum for Asia-Pacific Economic Cooperation (APEC). Science and technology advisors to foreign ministers and other mechanisms for integrating science advice into foreign ministries will be pivotal in developing evidence-informed foreign policies and in proactively identifying emerging science and technology trends that intersect with foreign policy.

In the United States, the National Academy of Sciences (NAS) recognized the need for stronger STI advice in foreign policy and recommended that the Department of State formally establish a science and technology adviser—a position subsequently created by the secretary of state and codified by Congress in 2000. More recently, the State Department has taken important steps to better harness STI resources. In December 2015, the department launched an Innovation Forum, chaired by Deputy Secretary of State Antony Blinken, designed to forge new partnerships with Silicon Valley and other innovation hubs and to connect senior officials with extragovernmental luminaries in business, innovation, and academia.

U.S. economic, legal, and societal priorities help guide the infusion of STI into foreign policy decision making. As it is officially known, the Office of the Science and Technology Adviser[1] to the Secretary of State (STAS) has thus sought since its inception to connect department leadership to the STI community in informing foreign policy. The STAS aims to build science, technology, and engineering expertise within the department, largely by placing PhD-level scientists and engineers on-site in a range of fellowship programs, such as the Jefferson Science Fellowship and the AAAS Science & Technology Policy Fellowship. By way of this network, the department can enlist the STI community to promote foreign policy priorities, including enabling innovation and knowledge networks in the United States and around the world through NODES (Networks of Diasporas in Engineering and Science), a partnership that includes the State Department,

AAAS, NAS, and the National Academy of Engineering. Such collaboration can also facilitate a central role for STI to achieve the United Nations–facilitated 2030 Agenda for Sustainable Development and Sustainable Development Goals. Through the State Department, bilateral meetings and multilateral forums engage critical partners such as Japan in discussions on emerging technologies and their role in mitigating international concerns ranging from disease pandemics to climate change to cybersecurity.

In Japan, an Advisory Panel on Science and Technology Diplomacy was established by the Minister for Foreign Affairs in July 2014 to consider ways to utilize science and technology in diplomacy. As recommended by the Advisory Panel, the position of Science and Technology Advisor to the Minister for Foreign Affairs was created in September 2015. Upon assignment of this first-ever science and technology advisor in the Japanese government, the Minister for Foreign Affairs raised two areas of importance in which he expected the advisor to contribute: formation of a science-and-technology-based perspective in addressing global challenges, and enhancement of personal connections and networks at home and abroad.

With these goals in mind, as part of a network aimed at bringing together the diverse knowledge within Japan's scientific community, the Advisory Board for the Promotion of Science and Technology Diplomacy was established, consisting of seventeen members representing different science and technology fields and tasked with supporting the S&T advisor. Thematic subgroups, known as study groups, were also convened as a bridge between the scientific experts' view and relevant departments within the diplomatic authority and other government ministries. In the study group discussions, an emphasis was placed the value of "evidence-based policymaking" supported by scientific data. Such a focus was reinforced at the latest G7 summit, held in Ise-Shima, Japan, in May 2016, from which outcome documents highlighted the need for data-based approaches for health studies and strengthening marine observation.

Another diplomatic occasion on which Japan's S&T advisor offered advice was the Sixth Tokyo International Conference for African Development (TICAD-VI), held in Nairobi in August 2016. The S&T advisor, through discussions at both the study group and the broader advisory board levels, compiled and submitted a set of recommendations to the minister for foreign affairs on the use of S&T for African development.

In these recommendations, compiled compactly under the title "A More Prosperous Africa with the Power of Science, Technology and Innovation," two issues were highlighted: (1) the need to convert the prevailing brain drain to "brain circulation"; and (2) the need for pragmatic application of the fruits of African scientists' research and development work. Reflecting these perspectives, the Japanese government announced its intended measures for contributing to African development at TICAD-VI, based on an overall notion that Japan would steadily

achieve the outcomes proposed in the Ise-Shima Summit's development agenda by utilizing Japanese excellence in STI.

STI is a central component of the U.S.-Japan partnership. In 1961, President John F. Kennedy made diplomatic history by announcing the creation of the U.S.-Japan Committee on Science Cooperation, the first cooperative science entity between the two countries. Today, drawing upon the twenty-nine years of science cooperation under the U.S.-Japan Science and Technology Agreement, the Joint High-Level Committee provides a regular forum to exchange views on critically important STI endeavors and brings together representatives from many government agencies in both countries to discuss areas for strategic cooperation, including on biomedical research and health, data science, high-performance computing, and energy. In January 2016, the United States and Japan celebrated fifty years of partnership in biomedical research through the U.S.-Japan Cooperative Medical Sciences Program, which today continues to support research on diseases endemic in the Asian region. The U.S. National Institutes of Health director and the Japan Agency for Medical Research and Development president recently signed a new NIH-AMED memorandum of cooperation, which will provide a foundation for continued partnership in biomedical research. Additionally, the United States and Japan have been long-standing partners in supporting science and technology cooperation with countries of the former Soviet Union through the International Science and Technology Center.

But our countries also face shared foreign policy challenges that exist outside the traditional mechanisms for science dialogue. What, for example, are the implications of new technologies, such as biotechnology and artificial intelligence, for U.S. and Japanese foreign policy? How can we better cooperate on issues related to the development of smart and resilient infrastructure? As these issues become ever more relevant, the U.S.-Japan bilateral relationship would greatly benefit from even deeper collaboration between our countries' foreign ministries. It is in this vein that our countries are establishing a new series of bilateral exchanges between the U.S. and Japanese science and technology advisors that will enable more profound cooperation on identifying and assessing opportunities where STI intersects with mutual and respective foreign policy priorities. The dialogue will also provide a venue to share best practices for incorporating science and technology inputs into our ministries.

Although this fresh bilateral dialogue will open new avenues of partnership on a range of issues relating to science advising in foreign policy, we will also focus on ways to further strengthen the role of scientific evidence-informed foreign policy decision making in other countries throughout the world. Along these lines, in February 2016, the United States and Japan, along with the United Kingdom and New Zealand, convened in Washington, D.C., for the inaugural meeting of the Foreign Ministry Science and Technology Advisers Network. Joined by the diplomatic missions of twelve other interested countries, participants exchanged

ideas to expand the role of science advice and STI advisory mechanisms within the foreign ministries of these additional countries. The U.S. and Japanese experience in science diplomacy represents an exemplary model for other countries, and it demonstrates clearly how scientists working together can connect government and citizens for the mutual benefit of our peoples and the world.

The accelerating pace of technological change, with its substantial impact on economic development, has underscored how countries must prioritize science and technology so as to strengthen their security and stay competitive in the twenty-first century global economy. Science and technology will provide unparalleled opportunities for bettering human lives through the promotion of peace, prosperity, and security around the world. In these complex and complicated times, increasing scientific literacy in foreign ministries is more imperative than ever. SD

Endnotes

1. *Language conventions alternatively use "adviser" and "advisor" when referring to a person in a specific position. The U.S. STAS is named as "Adviser"; the Japan STA is named as "Advisor." This usage is maintained throughout the paper.*