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The Morning After: Grand Challenges, Science Diplomacy, and the 2012 Election

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THROUGHOUT the autumn the presidential candidates will confront questions about such issues as the economy's stagnation, China's rise, and Iran's nuclear program. Given a campaign's limited bandwidth, the interface of science and foreign policy will get only perfunctory treatment. But on November 7, 2012, the day after the election, the winner and his national security team will face a series of science-based issues key to developing and implementing a coherent foreign policy. These include grand challenges related to health, economic growth, and climate change and the environment. While each challenge is complicated and involves many different elements, there are specific topics that will or should rank high on the action list.

Preparing for Emerging and Re-emerging Infectious Disease

At the start of his second term, President George W. Bush faced the threat of a global pandemic from the H5N1 virus, a.k.a. “bird flu.” The existence of a circulating virus with the potential to alter international health, trade, and security became one of the top national security issues facing the second-term president. By the summer of 2005 the White House was convening regular, high-level meetings (which included former Secretary of Health and Human Services Mike Leavitt and

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former Deputy Secretary of State Robert Zoellick, Mitt Romney's named transition chief and chair of the national security transition team, respectively) to prepare for and anticipate the national security and diplomatic responses. Simultaneously, health researchers and public health officials, from both inside and outside the government in the United States and abroad, were on constant call, ensuring that any response was underpinned by the best science.

Four years later, the nascent Obama administration faced its own potential global pandemic: the H1N1 virus, or "swine flu." Throughout the summer of 2009, scientists and health officials monitored the virulence and transmission efficiency of this emerging pandemic as it circulated in the Southern Hemisphere. Scientific knowledge was necessary to better understand and develop countermeasures for this efficiently spreading influenza pandemic, which was the first of the twenty-first century.

The ever-increasing global interactions and connectivity and the constant pool of circulating viruses—both animal and human—make another pandemic outbreak likely. The scale and scope of the disruption in the worst-case scenario, and the complex science and global distribution of such infectious diseases, speak to the high level of importance of this science and foreign policy issue.

Pursuing Non-traditional Advanced Climate Technologies

Climate change remains a politically divisive domestic issue, and not just along partisan lines. There are disagreements not only about the science but also about the policies to reduce greenhouse gas emissions. Internationally, the issue is even more complicated. Twenty years after the first global climate treaty and fifteen years after the Kyoto Protocol—which exempted such countries as China and India from emissions reductions and which expires at year's end—the global community is no closer to a comprehensive agreement on reducing greenhouse gas emissions. Additionally, the ability of the United States and other developed countries to control emissions is diminishing as new sources of emissions will not come from those countries. Instead, they will come from developing nations that will continue to focus on economic growth over climate remediation strategies. While a comprehensive climate treaty is unlikely, there is pressure to pursue new approaches.

Policy makers in the United States and abroad have started looking into different approaches to affect climate change and deal with its effects. While developing cutting-edge "clean" energy technologies will be crucial, the reality is that in the absence of comprehensive domestic legislation and the international requirements of a treaty, large-scale deployment will lag and cheap and abundant coal, natural gas, and oil will remain dominant. Adaptation strategies will increase in importance as will the efforts of engineers and economists. But ultimately, there will be growing pressure to act to slow, if not stop, human-caused climate changes. Geoengineering offers transformational technologies—such as the use of reflective material to decrease the amount of incoming solar energy hitting the earth or atmospheric carbon capture (reducing the amount of carbon by removing carbon dioxide from the atmosphere)—that are designed to rapidly (and if needed unilaterally) alter global temperatures. The approaches are not without major controversy (and cost) and would require a much better understanding of the science and engineering involved to determine their viability as policy approaches. Nevertheless, given the potential impacts from climate change and the real difficulties inherent in both negotiating and enforcing reductions in global greenhouse gas emissions, the next administration will need to work with international partners and the scientific and diplomatic communities to develop the science and policies governing the use of such technology.

Competing for Global Talent

Scientific discovery and innovation generate products, increase efficiency, and produce other positive outcomes that are central to any nation's long-term economic health and vitality. Such benefits depend on a nation's ability to both attract and access the best talent and ideas.

While the global competition for the top brains is intensifying, the United States remains the major attractor and producer of the best talent. But this lead is threatened. Over the past two decades the U.S. share of global research and development funding has dropped as more countries (especially those that are rapidly emerging as industrial competitors) are increasing those funds. At the same time, countries are working to compete for top talent within their borders and abroad by investing in university facilities and increasing outreach overseas.

The new administration will need to work with the next Congress to take the steps necessary to attract the best global talent. Designing and implementing an immigration policy that will attract and retain top scientists and engineers will go a long way to meeting the objective. But further steps will also be needed. Continued funding of basic research opportunities will help the nation's research institutions serve as magnets for the world's best minds. The United States also needs policies that encourage the free market of ideas and the efficient translation of research from lab bench to market. It is not enough to just attract the best talent to the United States, however; the country needs to develop strategies to increase its access to the best ideas germinating outside its borders. A more coherent strategy for international science engagement will be critical to fostering both of these goals and encouraging innovations needed to jump-start the economy.

After the Election

Ultimately, each of the challenges described above, and many other high-priority issues ranging from space science to food production to water supply, rely on the strategic use of science cooperation. Using that cooperation more strategically makes sense given that U.S. science continues to hold immense value for the international community. In the early 1970s—as the United States dealt with economic and military limitations stemming from the costly Apollo program, the controversial Vietnam War, and other initiatives—a speechwriter for Henry Kissinger (then U.S. secretary of state) noted that "[the secretary] thinks that America's ability to contribute money and run the world in the old-fashioned way of the 1950s and 1960s is now over. What we can contribute—and what the world wants—is our technological capabilities." Forty years later, a report from the Center for Strategic and International Studies on U.S. engagement and foreign aid to middle-income countries concluded, "The overwhelming consensus was that the United States is using inadequate instruments in a changing context, and that it should broaden its bilateral relationships with middle-income countries to reflect mutual interest. These areas of interest are numerous, but in every case include cooperation on strengthening civil society, science and technology, [and] people-to-people exchanges." This is an even more striking argument in the context of data from the Joint United Nations Programme on HIV/AIDS suggesting that by 2020, fifty-three current low-income nations are projected to move into middle-income status.

It is not surprising that engaging U.S. science remains a top priority for some of America's most important strategic allies. Poll after poll has shown that science is one of the most respected elements of U.S. society. American universities remain the standard for the international community. And the innovation ecosystems connected to these universities—Silicon Valley being the prime example—are the model for countries looking to increase their own economic productivity and innovation. Leveraging this requires that U.S. foreign policy leaders figure out how to better integrate science with broader efforts to build constructive relationships with allies and even competitors.

After the votes have been tallied, the acceptance speech has been delivered, and the confetti swept from the floor, the winner will face a policy landscape crowded with numerous urgent and important issues. Within this landscape, grand challenges at the interface of science and diplomacy will play an ever-greater role. Success in so many of these areas will depend on preparation before the election for policies that will start being implemented the morning after. SD