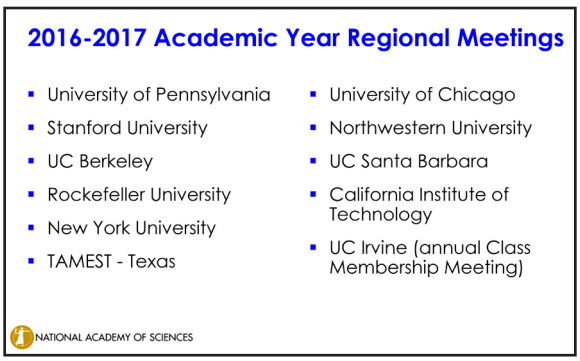
Annual Address to NAS Members

A Speech by Marcia McNutt, President
National Academy of Sciences
Presented at the Academy's 154th Annual Meeting
May 1, 2017

Good morning.

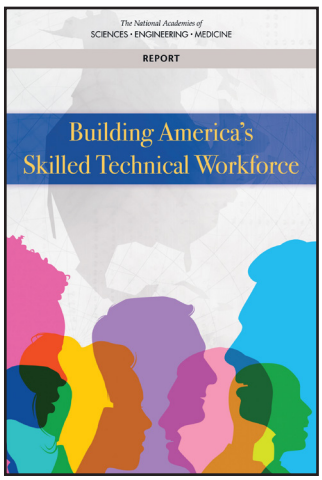
As we all gather for the 154th meeting of the National Academy of Sciences, we celebrate new members, new medalists, and new scientific insights. This meeting resembles in many ways numerous Academy celebrations that have preceded it. As your new president, I have come to appreciate the importance of the history and traditions of this venerated institution and my role in protecting and strengthening them. I have also felt it my duty in this position to work forthrightly to counter any negative trends concerning science and the scientific enterprise. The benefits from science, unfolding across every aspect of society, were made possible by decades of sustained investment in basic research. Even greater discoveries will emerge in the years ahead if America sustains and strengthens—not weakens—its support for science. Discovery is still increasing at an accelerating rate: Vannevar Bush's "Endless Frontier" is still alive and well. The promise of science that President Lincoln and the founders of the Academy envisioned in 1863 is being realized in ways that would gratify them and that underscores their prescience in establishing the Academy. New fields of science are emerging. New scientific questions are being pursued at the boundaries of well-established disciplines. And the convergence of disciplines is yielding new insights and astounding revelations of new knowledge. The American pioneering spirit in science and the American sense of exploration and discovery are as vibrant as ever. We don't always get it exactly right the first time, but science is fundamentally a self-correcting institution. Americans understand this. Survey results show consistently that Americans hold science and scientists in the highest regard, more so than most other human pursuits and professions.

Despite my optimism about science, I do see major storm clouds on the horizon, fundamental changes sweeping the nation and the world, and new norms to which we must adjust. "Business as usual" is not a viable option for the Academy in the near future if we are to fulfill our mission and remain a relevant institution. I have spent my time here since assuming the office of the president listening to all of you during the many regional meetings that were conducted at institutions across the U.S. and abroad.



I have met with many groups here within the National Academies to better understand the internal challenges we face. So this morning I'd like to talk to you about how I see the changing national and international situation and how the Academy needs to better position itself so as to meet our mission and remain relevant.

Let's start with socio-economic trends. My father worked from his first day to his last at 144 Glenwood Avenue in Minneapolis—where his father worked and his father before that. In contrast, two of my three daughters work in industries that did not even exist when they were born and one in a market that she herself created. Students today need to become life-long learners, because they will likely have four or five different jobs and will constantly need to upgrade their skills to be prepared for the next opportunity. We need to think how the National Academies can periodically scan for emerging career paths and shape training programs that transition workers to those new careers with minimal disruption to their daily lives. Of particular concern is the segment of the workforce that never attended college and is rapidly being displaced by robotics, disruptive technologies, and international competition. It is tragic to see in the news the plight of unemployed factory workers and miners, and then hear how the solar industry cannot find enough qualified people to hire. How can the Academies best help displaced workers so that they qualify for good paying, technical jobs in modern industries? An example of a report that the National Academies has in progress to meet this challenge is *Building America's Skilled Technical Workforce*, which will be released later this month.

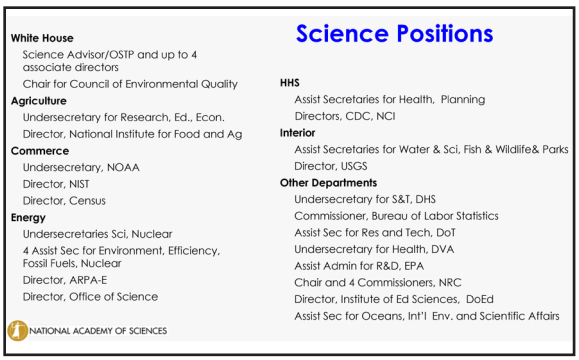


Another socio-economic trend is the gap in wealth inequality, which has been widening in recent decades, both here and in some European nations. Inequality was an important topic of mutual interest at a recent meeting between the officers of the National Academy of Sciences and the Royal Society in London. It becomes easier to understand the rise of populism in so many nations around the world and the readiness to believe that immigrants are the source of the problem when a growing fraction of citizens are concerned that economic opportunity is leaving them behind. *Forbes* reported last year that 63 percent of Americans would be unable to come up with an extra $500 if their car broke down, or their refrigerator gave out, or some other unexpected emergency required immediate cash. Science is not the root of this growing inequality, but I do believe we can use the tools of science to help seek solutions. At our meeting with the Royal Society, the officers prepared a joint statement expressing our commitment to work together to ensure that science continues to deliver public good that benefits all, not just the top 1 percent. An excellent example of an Academies study that is aligned with this goal is the *American Opportunity Study*, an ambitious tracking of economic, educational, and occupational mobility across and within generations. It will answer the question: Is the American Dream still alive? And if so, who is breaking free from disadvantaged origins today, and how are they doing it?

In addition to these socio-economic issues, many of which are shared internationally, numerous other global challenges are common threats that science can address. Aging population. Root causes of terrorism. Climate change. Pandemic diseases. The NAS believes that at a time when our own government appears to be signaling a retreat from international alliances, it is important for us to increase our international visibility to assert that U.S. science is still vibrant and willing to assume leadership. We have worked with international partners on science input to the G7 summit on topics such as neurodegenerative disease, preserving cultural heritage in the face of war and natural disasters,

and the importance of science and technology to economic growth. We also delivered a statement to the G20 summit on global health: combating communicable and non-communicable diseases. Along with the Russian Academy of Sciences and the French Academy, we are organizing workshops on the roots of violent extremism. And we have continued our very successful bi- and tri-lateral Frontiers of Science programs that allow our young scientists to exchange insights with counterparts abroad.

Closer to home, we have also been making progress lately in reaching out to the new administration. This administration is off to an historically slow start in terms of political appointments, and for that reason the administration's science policy is still forming. However, this delay provides an unusually large window of time for the NAS to help shape the administration's key science appointments and major science initiatives.

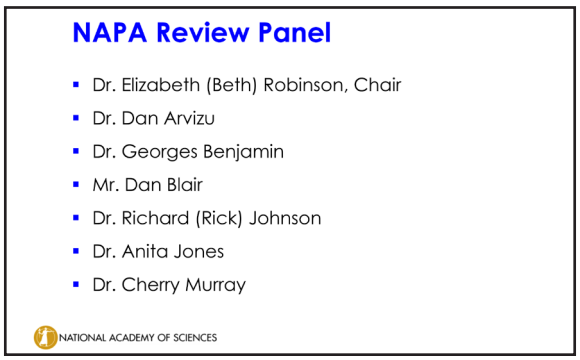


I have had several meetings with a key White House advisor to build a relationship and discuss these opportunities. The National Academies presidents, together with staff and volunteer leadership, met with a senior White House advisor for several hours for a frank conversation about science in the new administration. This meeting was an important step in opening up a constructive line of communication with someone very close to the president. We all left the meeting with a much better understanding of how the Academies can be helpful. For example, this administration may choose to remain leaner than previous administrations in terms of policy personnel. If so, it could provide an opportunity for the Academies to help fill in some gaps. We are also working on finding qualified individuals to fill the many important government posts that remain vacant as well as for ideas of major science initiatives that would advance human knowledge and contribute to the president's stated priorities of national security, American competitiveness, and better health care.

In terms of working with the new administration, I expect that we will see an acceleration of two trends already apparent from previous administrations. The first is budgetary. While federal sponsors value our consensus reports most highly, when federal budgets are tight they become cost-conscious. The second is timeliness. The tenure of political appointees has been decreasing, such that the average is now 18-24 months. Therefore, it is no wonder that few senior administrators would want to wait two years for a report to be delivered just as he or she is leaving government service. For these reasons and others, National Academy of Engineering President Dan Mote, National Academy of Medicine President Victor Dzau, and I have initiated the first-ever external review of the National Research Council. The charge to the review panel is to determine how we can better execute our mission in a time of tightening government budgets and accelerating timelines. There are some obvious targets to consider. Would synchronizing processes and platforms across NRC divisions streamline support costs? Does reducing the down time between committee meetings use staff time more efficiently and deliver reports faster? Can we harness state-of-the-art technology for committee interaction, document production, and dissemination of results as befits a 21st century scientific organization? Are there unintended consequences of altering the status quo that we need to worry about?

The review got underway in March and is being conducted by NAPA, the National Academy of Public Administration. The members of the panel who will oversee the review are drawn

from members of the three Academies and from the roster of NAPA Fellows. I am grateful to the Sloan Foundation for supporting the cost of this review. The panel intends to deliver its recommendations at the end of the year. I look forward to sharing them with you.



I would add that this review is just one of the many ways that the three Academies are working very closely together in a way that would not have been possible before the IOM became the NAM. It has truly been a pleasure to work in close collaboration with Dan Mote at the NAE and Victor Dzau at the NAM to ensure a consistent position of the three Academies on issues important to the American research community. Another example of how we are working together is that we are jointly appointing a committee to advise the three presidents, to help us further the application of convergence research approaches to the many issues beyond just the biomedical sciences that would benefit from this way of thinking.

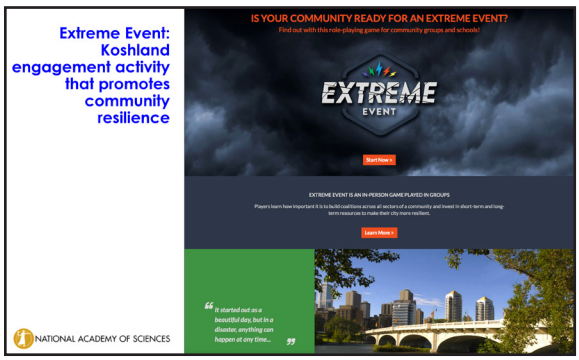
While changes to our report operations at the Academies await the outcome of the NAPA review, in the meantime we are moving briskly ahead with updating our conflict-of-interest policy, which brings me to the broader issue of integrity in science. As you well know, in science, integrity is everything. The Academy must be at the forefront of efforts to ensure that the rigor and integrity of the scientific enterprise is upheld, above all else. Examples of our recent efforts in this regard are last month's three-day Sackler colloquium on the topic of reproducibility. That was followed by the release of a new Academies report on integrity in research. It calls for establishing a new nonprofit and independent Advisory Board to promote research integrity across all sectors and disciplines as its core mission. The report also recommends stronger actions against practices detrimental to research that are on the borderline to misconduct.

Because the scientific method is the most reliable generator of knowledge of the world we live in, we, as an Academy, have a responsibility to do everything possible to nurture the self-correcting nature of science, and to safeguard the public's trust in it. To that end, I've asked for our own policies and procedures to be reviewed with an eye toward constant improvement. Having been a committee member, like many of you, I know first-hand the rigor of the consensus study process here, including the value that is added by the careful final check from the Report Review Committee. But just like with the broader scientific enterprise, I believe that we should always be looking for ways to evolve, and maintaining the highest levels of scientific integrity is clearly paramount to our ability to provide unbiased advice.

In particular, our guidance for revising our conflict-of-interest policies has its origins from a 2015 gathering at the Annenberg Retreat at Sunnylands organized by Ralph Cicerone where a small group of Academy members discussed how to bolster incentives to the highest standards of scientific integrity, and maintain the historically high trust of the public in the scientific profession. Following on the recommendations of that retreat, which were published in *Science*, we can begin by using more neutral language. The term "conflict of interest" implies that all relationships are necessarily corruptive. We suggest replacing it with "disclosure of relevant relationships" to encourage more complete disclosure from all parties. We have strengthened our procedures for reviewing staff relationships, are now looking more systematically at whether nonprofit organizations that support our studies are being funded by corpora-

tions or others with a stake in the outcome of the study, and will disclose unavoidable conflicts of study committee members in a more transparent manner in the committee's report. We are also examining the extent to which we should take past as well as current activities and relationships into account in determining if a potential committee member is conflicted, and whether the longstanding dollar threshold that triggers a financial disclosure is still appropriate.

I'm very excited to tell you about two other initiatives that we are launching here at the NAS. Both are intended to improve science engagement with the public in light of concerns that the respect for evidence in decision-making is waning and acceptance of alternate facts is waxing. The first is the development of the Koshland Public Engagement Program. This program is an important evolution in the mission of the Koshland Science Museum recommended by a review committee chaired by NAS member Vicki Chandler, supported by the Koshland Foundation, and endorsed by the NAS Council.



Our plan is to build on the success of the science museum by expanding its reach through online platforms to involve a much larger audience than those we reach with the current traffic into the Keck Center. To complement these virtual interactions we will provide more accessible and visible face-to face group activities, displays, and science open houses in the main NAS building here right off the Mall as well as in other venues. The March for Science this last weekend provided a wonderful opportunity to test drive a Saturday open house here.

We had a great response! With Albert Einstein outside to lure people to our door, we had just shy of 500 visitors in the space of a few hours. One future scientist even noticed the solar panels on the roof of the East Court outside the Lecture Room. Ralph would be so proud!

The second initiative we are launching is tentatively titled "America Asks, Science Answers." We will be surveying Americans on what contemporary questions they would like answered. The impacts of fracking? The safety of GMOs? The practicality of carbon sequestration? The answers are generally found in our peer-reviewed reports, but usually not in a format that an average non-scientist can easily extract, and most Americans don't even know to go to our reports to find answers. Using our reports, professional writers will prepare responses to these questions that are written for the lay public and posted in an attractive series of web pages. As part of the outreach for the project, we plan to incorporate this material into

Wikipedia articles—to which many Americans turn for answers—and to other digital media, with the dual objectives of providing authoritative information and raising the visibility of our work. The ultimate goal is to ensure that the Academy be a portal for those seeking knowledge.

These new initiatives require new resources. You will all hear in upcoming appeals about the need for us to increase our participation rate in the NAS annual fund. As many of you know from the other membership organizations you support, the percentage of members who contribute to the annual fund is a benchmark that foundations and outside donors use to gauge member confidence in the importance of the mission of the organization. Currently the NAS participation rate is below 20 percent. With anticipated challenges in federal funding in the foreseeable future, increasing sources of non-federal funding is more important now than ever before. I am very grateful to the NAS members and friends of the Academy who have already given generously. The ability of the Academy to respond to new challenges and launch studies on pressing issues of the day is underpinned by flexible support from the annual fund and our endowment. This last year has seen tremendous support from donations to the endowment fund established by Ralph and Carol Cicerone, and the Simons Foundation's $10 million challenge grant to match gifts to that fund. I am grateful to Jim and Marilyn Simons and the many members, friends, and foundations who have supported this fund that strengthens the Academy and honors Ralph's service.

Finally, the wonderful Kavli gift. The Kavli Foundation has generously pledged $10.5 million to establish an unrestricted endowment for the National Academy of Sciences, and in recognition of this extraordinary gift, we have named the auditorium for Fred Kavli, a wonderful friend of the Academy. All of the initiatives I have just mentioned—such as more effectively providing advice to the nation, increasing our international profile, elevating scientific integrity, expanding public engagement, and more effectively disseminating our work through "America Asks, Science Answers"—will benefit from The Kavli Foundation's gift, and the additional funds that it will generate under the terms of the Simons Foundation's match.