# Science Policy

## *Initiative on Science, Engineering, and Technology*


### Neal Lane

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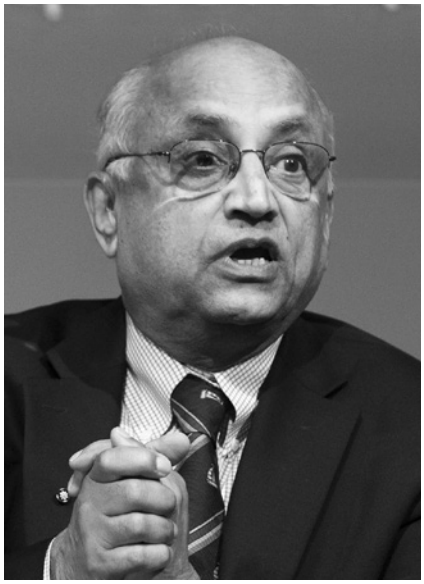
**The Initiative on Science, Engineering, and Technology provides a framework for the Academy's many projects about science and technology policy and the adaptation of science and technology in society.**

The American Academy has been concerned about the pursuit of scientific knowledge since the very foundation of the organization. Today, the Academy's Initiative on Science, Engineering, and Technology, which I chair with Charles Vest,† former President of MIT and of the National Academy of Engineering, provides a framework for the Academy's many projects about science and technology policy and the adaptation of science and technology in society.

Recent Academy projects have examined scientific literacy, the treatment of scientific topics in the university curricula, the evolution of the Internet and its influence on social norms and institutions, and public trust in vaccines. The Academy's ongoing ARISE II project – Advancing Research in Science and Engineering: The Role of Academia, Industry, and Government in the 21st Century – seeks to foster new relationships across the disciplines and between the private and public sectors to sustain a competitive U.S. research enterprise. I would like to welcome Venkatesh Narayanamurti to speak about ARISE II, which he cochairs with Keith Yamamoto.

† The Academy mourns the passing of Charles Vest (September 9, 1941 – December 12, 2013).

# *ARISE II*




## Venkatesh Narayanamurti

*Venkatesh Narayanamurti is Director of the Science, Technology, and Public Policy Program at the Belfer Center for Science and International Affairs at the Harvard Kennedy School. He is also the Benjamin Peirce Professor of Technology and Public Policy and a Professor of Physics at Harvard University. He is Codirector of the Academy's ARISE II project. He was elected a Fellow of the American Academy in 2007 and serves as a member of the Academy's Board of Directors and Council.*


**The two overarching goals of ARISE II are to move from interdisciplinary to transdisciplinary research; and to develop new policies and networks that bridge the divide between basic research and application, promoting cooperative, synergistic interactions among the academic, government, and private sectors throughout the discovery and development process.**

The Academy's ARISE I project, which published its report in 2008, was quite important in two respects: it identified high-risk, high-reward research as a critical element of advancing America's research enterprise; and it argued for the support and funding of early-career investigators. In fact, partly as an outgrowth of the ARISE I report, the National Institutes of Health (NIH) launched the NIH Director's Pioneer Awards to support high-risk, high-reward biomedical and behavioral research. Meanwhile, the Department of Energy has increasingly tried to fund young investigators, reflecting the perceived value of youthful input in a field where the average age of investigators has been steadily rising.

When the ARISE II executive committee met to discuss the next set of challenges, they concluded that there were many issues for which the interplay of the physical sciences, biological sciences, engineering, computation, and medicine could be instructive. Therefore, to learn from each other's disciplines and to see what new connections could be formed, our committee drew its members from these many and diverse fields, producing a far-reaching and stimulating debate about what actually were the major problems ARISE II ought to address. Together, we looked to the origins of the physical sciences, biological sciences, and engineering and we traced that history to the present day, and we concluded that research now is at an inflection point.

The physical sciences and engineering became prominent in the national scene, especially with federal agencies, in response to the great challenges of World War II. The Vannevar Bush report, *Science, the Endless Frontier*, which called for an expansion of governmental support for the sciences, was critical in drawing a connection between the physical sciences and engineering and national security. Vannevar Bush made several other important arguments in his report, including that societal well-being was closely related to the NIH, and that the development of manpower and of the education system were important roles for the federal government to play in the economic and technological development of the nation. And of course, the National Science Foundation (NSF) owes its very origins to the Vannevar Bush report. The report has served this country well in many ways, helping to establish the continuum of discovery and application; but it is time now that we look again at how the scientific disciplines are faring, and at what more can be done to support their advancement.

On the economic front, increased global competition has caused profound changes, especially in the physical sciences and engineering. The end of the Cold War, the decrease in the emphasis on national security, and the increase in economic competition have led to a new era of globalization. But these events also signaled that the physical sciences and engineering, condensed matter physics and engineering especially, were closely aligned because of work driven by World War II and conducted in the industrial laboratories that were then icons of the surging fields. Bell Labs, IBM, Xerox PARC – these companies no longer perform the level of research that we as a nation require.

The life sciences had a slightly different origin. The pharmaceutical industry actually evolved out of chemistry and mechanical engineering; but historically, there has been very little connection between basic research in biology and the pharmaceutical industry. The pharmaceutical industry is simply not doing the long-term work necessary for broad discovery and invention. There are, of course, counter-examples with biotechnology companies such as Genentech, but nevertheless, there has been an established culture where the discovery is disconnected from its applications.

Computation has become an important branch of science and engineering. In fact, much of the recent progress in biology is due to biologists having become much more quantitative, increasing their ability to process the big data the field produces. Similarly, biology has profoundly influenced engineering, leading to the introduction of synthesized, biologically inspired materials. Both developments suggest the many ways that the physical sciences, biology, medicine, computation, and engineering can learn and benefit from each other.

In light of this, our committee identified two overarching goals and eleven recommendations that strive for new models of integration, cooperation, and coordination across two intersecting planes. You can think about the disciplines of physics, chemistry, engineering, medicine, biology, and computation as one axis, and the stakeholders – industry, government, and academia – as the other axis. Of course, these fields and sectors are intertwined in many complex ways, but the ARISE II committee sought to rethink these two axes and make certain recommendations that may lead to a deeper union both between the stakeholders and between the academic disciplines.

And even though interdisciplinary and multidisciplinary research has been discussed for many years – the field I come from, material science and condensed matter physics, was inherently always interdisciplinary – we are also searching now for a fundamental union between the disciplines – especially across the physical and life sciences. That's why we coined the word *transdisciplinary*. Interdisciplinary implies preexisting space between disciplines, while we are exploring a deeper connection between the fields of research. And so we defined our two overarching goals: to move from interdisciplinary to transdisciplinary research; and to develop new policies and networks that bridge the divide between basic research and application, promoting cooperative, synergistic interactions among the academic, government, and private sectors throughout the discovery and development process.

Within these goals is a series of recommendations. As one example, we recommend support for shared central research facilities that can bring different groups of researchers and different methods of organization together. And with such core research facilities, we recommend the funding of stable staff appointments to direct them. Such physical common ground can serve as a unifying force for these disciplines. There is no one solution to unifying the fields and creating shared stakeholder interests, but we have developed a collection of such recommendations that together can form a deeper integration.

And of course, we feel that this is both a bottom-up and a top-down enterprise. For example, deans and provosts of universities must provide the resources, as well as act as the conductors to actually facilitate departmental integration. Grand challenges, meanwhile, represent bottom-up action, beginning with researchers identifying the compelling and timely problems that stand at the frontier of knowledge. Such was the case with President Obama's BRAIN Initiative (Brain Research through Advancing Innovative Neurotechnologies), which began with the efforts of a molecular biologist and have since brought together the NIH, the Defense Advanced Research Projects Agency, and NSF, in the process hybridizing the operational structure of each organization.

The alliance between academia and industry is a major focus of ARISE II's recommendations, which seek to enhance the permeability between the two at all career stages, and to develop policies that focus on the shared interests of academia and industry. We believe industry must change in significant ways and must be willing to participate in research as a partner, or to contribute some of the major funding, as has been the case in the Human Genome Consortium. Of course, with transdisciplinary and integrative research there are intellectual property issues, though these have often been overemphasized. In some cases, especially in research targeting long-term and far-reaching problems, intellectual property, or creating profits for a university or industry, should not be the driving force; rather, the intellectual exchange, resource exchange, the growth of knowledge, and the benefit to society is of principal importance. And in this vein, ARISE II has made recommendations and encouraged bold experimentation for industry, academia, government, and funding agencies. I think that the ARISE II report, along with other reports of the American Academy and the President's Council of Advisors on Science and Technology, will help build enough momentum in these extremely important areas to ensure a bright future for science and engineering in the United States.

# *New Models for U.S. Science & Technology Policy*

Neal Lane

The focus of the Academy's project on New Models for U.S. Science & Technology Policy – which I cochair with Norm Augustine, retired Chairman and CEO of Lockheed Martin and former Undersecretary of the Army – is the need, in this country, for more long-range thinking and planning in many areas of science and technology (S&T) policy. This project joins a collection of important studies by the American Academy, the National Academies, and other think tanks around the country that have taken on various aspects of S&T policy. These studies have produced reports containing thoughtful recommendations, which stand as the product of the enormous intellectual resources of all of you who are involved in these issues. But the response to these projects on the part of the policy-making apparatus, largely at the federal level, has been disappointing.

The New Models project is bringing together experienced researchers, former university presidents, industrial leaders, and former members of Congress and federal officials – all of whom have experience in the world of public policy – to see if there might be a better way forward. Our first thought was, why not reorganize government? Well, some of us are not going to be around long enough to see that happen, and I think we have plenty of data to show that if you do indeed reorganize government, it's likely to go badly. So we are looking elsewhere. Our goal is to explore new mechanisms – models – that can raise the national profile of science and technology; promote long-term S&T policy considerations and planning; and help the American people better understand the importance of investments in S&T, research in particular. Without the public's awareness and support, U.S. science and technology is likely to stay "in the weeds," mixed in with all the other policy matters that vie for public attention and political support. While many of these other issues are important, it is our view that advances in science and technology are vital to the nation's ability to deal with most of its other needs and, thus, warrant special attention. Moreover, since research discoveries do not usually pay off right away, it takes patient investments over time to bear fruit – and that is not today's mindset.

**The goal of this project is to explore new mechanisms – models – that can raise the national profile of science and technology; promote long-term S&T policy considerations and planning; and help the American people better understand the importance of investments in S&T, research in particular.**

As Venky has already noted, at the end of World War II, the Vannevar Bush report, *Science, the Endless Frontier*, spawned a partnership – a kind of agreement between the federal government and the universities – whereby taxpayer money pays for research, and academic researchers and their students make discoveries and invent technologies, the results of which are made public through peer-reviewed journals. Private industry takes it from there, and through the technological and business innovation of many forward-looking companies the fruits of research are made available to the American people. The agreement has worked quite well for half a century; but much has changed in that period of time and many of us have begun to question how well this system serves us today.

In 1993, I went to Washington, D.C., as a new Director to the National Science Foundation (NSF), and began to make the rounds of Washington to introduce myself and talk about the Foundation. Many people on Capitol Hill thought the NSF was that place with the Einstein statue outside. I mean, I love the place with the Einstein statue, but it is really not part of the federal government. Fortunately, there were knowledgeable champions of science on the Hill who explained to me that there is a big disconnect: "First of all, the public is not hearing from you scientists. We in Congress are not hearing from you very much either. And we are definitely not hearing from our constituents that they care a lot about these issues. You guys need to straighten this out." This stark message got my attention. I then remembered that former Congressman George Brown had told us much the same

thing over thirty years ago; but at the time we thought, "George is a friend, but maybe he doesn't quite get it." Well, he did get it: he saw the problems coming long before the Gingrich revolution, which was not necessarily helpful for science and technology, at least research funding.

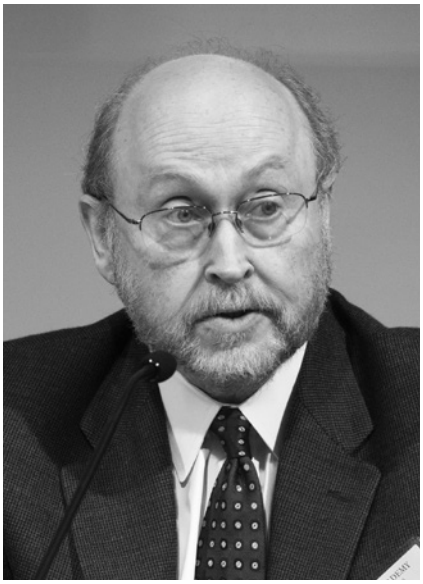
Today, the nation's federal government-university partnership has changed, as industry has steadily increased its funding of R&D – though much more D than R – and its collaboration with universities. Our view, at least my view, is that going forward, the role of industry will be increasingly important, both through enhanced cooperation with universities and by voicing stronger support for federal funding of university research. Otherwise, it is hard to imagine how we can steer this American S&T ship in a more positive direction. The ARISE II report obviously represents an important step. These are large, complex issues that Venky's ARISE II committee took on. Our job with the New Models initiative is to find a way to ensure that the recommendations of ARISE II and ARISE I, as well as the important reports coming out of the National Academies' National Research Council, the National Science Board, the President's Council of Advisors on Science and Technology, and other organizations keep the drumbeat going so that we can move the nation's S&T policies and policy-making apparatus toward necessary change.

Do we now know what the better way is? Well, frankly, no. But we are having a good discussion about it and we have some big ideas on the table. I can't be sure which ideas will see the light of day in our final report, but at least we are having an adult conversation about important matters. Our study group has met twice to discuss how to put these ideas into practice. We have held several conference calls and made individual calls on the periphery. Norm and I both agree that publication of the report, sometime this spring, is only the first step. The next step is to expand these conversations and the ownership of the ideas.

We will likely frame the report around the theme of restoring the American Dream. We used to hear quite a lot about that dream – our parents lived it, and many of us did as well. I don't think we hear much about the American dream anymore, and we should worry about that. Given that science and technology are central to future U.S. industries, jobs, and the well-being of all Americans, it is worth explaining the connection. Research is only part of the picture, but it is a critical front-end part. No research means no science and technology, hence, no progress as a society. We hope we can make a difference. As with all American Academy projects, we strongly encourage you to support what we are doing, share your ideas, and participate in whatever way you wish.

# Security and Energy

## *Committee on International Security Studies*




### Steven E. Miller

*Steven E. Miller is Director of the International Security Program at the Belfer Center for Science and International Affairs at the Harvard Kennedy School. He serves as Cochair of the Academy's Committee on International Security Studies and as Codirector of the Academy's Global Nuclear Future Initiative. He was elected a Fellow of the American Academy in 2006 and serves as a member of the Academy's Council.*


**The Committee on International Security Studies is setting its agenda for the future, and we are interested in launching projects that address residual nuclear risks, the ethical dimensions of the use of force, and emerging security threats, including cyber security.**

Let me first offer congratulations to the new members of the American Academy. I can personally attest to the fact that if you let yourself be drawn into the work of the Academy, it can become a significant and gratifying strand in your professional portfolio. What you have in front of you is a potentially life-altering opportunity. For me, over the last decade, a large fraction of my personal research agenda has run through the American Academy, and I am very much the better for it. My role here is first to give you a thumbnail sketch of the Committee on International Security Studies, of which I am privileged to be cochair. And then we will turn to our colleagues to hear about a couple of the projects that we have undertaken in the recent past.

In the summer of 1960, the American Academy convened a study group on the subject of arms control, which was a novel concept at the time. Not even theoretically conceived, much less politically or policy-relevant, this study group evolved into something that came to be known in the intellectual history of the field as the Harvard-MIT Study Group on Arms Control, which was institutionalized at the Academy. The group produced a special issue of the Academy's journal, *Dædalus*, which was subsequently published as an edited volume called *Arms Control, Disarmament, and National Security*. This is now regarded as the so-called bible of arms control. The group also sponsored the work that led to the single most famous conceptual study of arms control, a little book called *Strategy and Arms Control*, by Nobel laureate Thomas Schelling and his then-graduate student Morton Halperin.

This work was absolutely formative, both in developing the concept of arms control and in promulgating it credibly into the policy debate. In fact, in December 1960, there was a meeting in Moscow, something that in those days was so unusual as to be unprecedented, at which the *Dædalus* volumes on arms control were actually briefed to Soviet colleagues. It is often said that arms control is an unnatural act in the sense that it involves a kind of security cooperation with your bitter enemy. So, the initial reaction of our Soviet friends was not exactly congenial, but over the course of a decade, they came to be converted to this set of ideas.

The taproot was the proposition that even the most bitter enemies, even the most deeply hostile adversaries in the nuclear era shared a common interest in avoiding nuclear war. And that this shared interest could best be pursued in the context of negotiated management of the rivalry and arms race, through which both sides could be more secure and the nuclear balance could be more stable with less expenditure of resources than would otherwise have been the case. By 1972, we had our first major arms control agreement between the Soviet Union and the United States, and that initiated a long era of arms control between these two great rivals, which in fact constituted the core of Soviet-American relations over the better part of a quarter of a century. The work that was done at the Academy can accurately be described as world-changing.

Well, this group came to be institutionalized. By 1963, there was a committee within the Academy. It has existed continuously ever since. In 1982, it came to take its current form and name, the Committee on International Security Studies. We have just passed our thirtieth anniversary. From one decade to the next, we have tried to tackle what we view as some of the biggest challenges on which we have some comparative advantage and where we believe we could contribute to the national debate. In the 1980s, the Academy was a major player in

the so-called Star Wars Debate on missile defense, catalyzed by President Reagan's missile defense initiative. In the 1990s, the Academy sponsored a strong strand of work on the questions of sovereignty and intervention, triggered in part by the protracted crisis in the Balkans and whether or not we should intervene there.

In the last decade, we sponsored work looking at how to order what was called the post-Soviet space. The collapse of the Soviet Union created a vast, unsettled reach in much of Central Eurasia – how were we to think about preserving security and avoiding conflict in that part of the world? John Steinbruner, my cochair of the committee, did a wonderful project on the governance of the military use of space that was very influential in shaping how people think about these management issues.

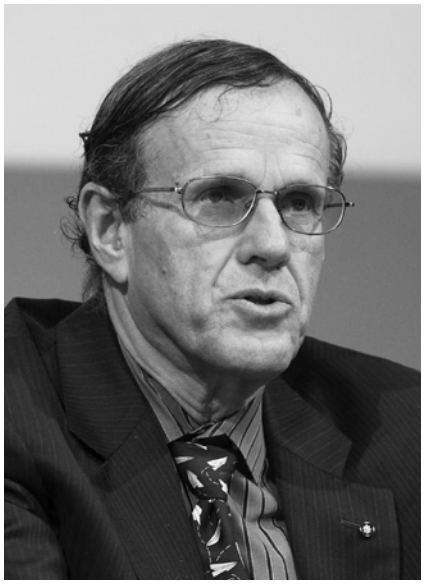
The committee has met over the last few days and we are beginning to set our agenda for the future, drawing from a number of exciting possibilities. We are interested in addressing what we would describe as residual nuclear risks. Begin with the remarkable fact that almost a quarter of a century after the fall of the Soviet Union, many of the features, attributes, and embedded risks associated with Cold War nuclear postures still exist, still have not been disentangled, still have not been eliminated, and worse, have completely dropped off of the policy agenda. There is no interest or enthusiasm for these subjects at all.

Our committee has substantial enthusiasm for launching a project on the ethical dimensions of the use of force in this new era that we are entering. There are all kinds of new questions arising. In recent years, for example, the United States has arrogated to itself the right to identify and assassinate by drone attack anyone it regards as an enemy. One by one, person by person. Is this a norm we would find acceptable if this proposition were directed against citizens of the United States by command of another state? In its far-flung interventions and global policing activities (for example, in the struggle to combat international terrorism), the United States sometimes believes it necessary to take steps that in many contexts are regarded as lawless. Can the United States break the rules in order to enforce a rules-based system? What are the ethical dimensions of that?

We also are eager to look at emerging security threats, and there is substantial interest in the committee in developing a project on cyber security, which is one of the new areas that has become very fashionable in the security realm. Here again, the United States plays a special role: so far, it is the leading practitioner of the known cyber attacks. So here we are again, at the cutting edge of creating precedents and establishing norms that, if directed against us, we may not find so appetizing.

Recently, the major project that the committee has sponsored in the security area has been known as the Global Nuclear Future project. It is now five years old; and I'm heavily involved in it, along with my colleague, Bob Rosner, professor of physics and astrophysics at the University of Chicago and former director of the Argonne National Laboratory. Bob is next going to describe what we have been up to in the Global Nuclear Future project.

## *The Global Nuclear Future*



### Robert Rosner

*Robert Rosner is the William E. Wrather Distinguished Service Professor in the Departments of Astronomy & Astrophysics and Physics at the University of Chicago. He is also on the faculty of the Enrico Fermi Institute and the Harris School of Public Policy Studies. He is Senior Advisor to the Academy's Global Nuclear Future Initiative. He was elected a Fellow of the American Academy in 2001 and serves as a member of the Academy's Council.*

The aim of the Global Nuclear Future project is very simply stated: to explore methods to ensure the safe, secure, and sustainable management of the global expansion of nuclear power. The project has drawn from a broad range of U.S. and international scholars, spanning across disciplines as varied as international security, public policy, and physics. And Steve is being modest – he is the codirector of the project with Scott Sagan of Stanford. I serve as a technical advisor. The project has been funded largely by the John D. and Catherine T. MacArthur Foundation, the William and Flora Hewlett Foundation, the Alfred P.

**Can we influence the nuclear policy-building processes of nuclear newcomers, and of other relevant regional stakeholders, to ensure that future national and regional nuclear policies conform to international best practices and treaties on nuclear safety, security, and non-proliferation?**

Sloan Foundation, and Carnegie Corporation of New York.

We have focused primarily on the Middle East and Southeast Asia because they are the regions where most of the current interest in expanding nuclear power is today. More specifically, we have focused on countries that are actively engaged in thinking about becoming nuclear. They are not currently nuclear states; they want to be. The classic examples of countries pursuing peaceful nuclear energy programs would be the United Arab Emirates – in particular, Abu Dhabi – and Vietnam. The question is, how do they introduce nuclear power in these areas in a way that is safe and secure, given that their domestic human and technical infrastructure is typically not appropriate for nuclear power? How do they actually go about becoming nuclear, and how do they do it in a way that inspires some sense of confidence in the rest of the world? And how do these countries pursuing nuclear energy programs impact and ultimately shape inter-state relations, regional nuclear governance processes, and the global nuclear order more broadly?

The obvious question for us is: can we influence the nuclear policy-building processes of these nuclear newcomers, and of other relevant regional stakeholders, to ensure that future national and regional nuclear policies conform to international best practices and treaties on nuclear safety, security, and non-proliferation? How do we speak to the relevant stakeholders, making sure that nuclear power usage ultimately does conform to international standards? That is at the heart of the issue. Right up front you have to admit that the time has long passed where we, as Americans, can lecture other people, if such a time ever existed. The question therefore is, as a practical matter, how do we engage in these discussions without seeming to instruct or condescend from the outside?

Our aim has been to arrive at solutions collaboratively, with the active involvement of all principal stakeholders. We have pursued this goal by engaging in an open discussion with these stakeholders in which we are simply equals. And in these discussions we focus not only on the desirable end-states, the secure nuclear-powered nirvana where we would like to be, but also on how you actually get there given both the political and financial constraints. To help facilitate these discussions, we operate under Chatham House Rule, and in response we have found our discussion partners to be engaged, frank, and focused on solutions.

So what have we actually done? We have convened regional conferences, typically outside the United States, involving key stakeholders, including participants from industry, government, and involved NGOs. In the United States, we have hosted policy briefings with government officials and representatives of the international nuclear industry. And being largely academics, we have also commissioned papers and volumes coauthored by regional experts, fostering academic cooperation and promoting inter-state intellectual exchanges. It is not only our voice being broadcast.

The project started with a two-volume issue of *Dædalus*. That is actually how I got roped into this project, and it's a very effective tool, I must say. That two-volume series of essays was quite definitive in laying out the various aspects of the nuclear fuel cycle and its surrounding issues, and it was not simply singing from one sheet. Contributors spanned the full range of expertise from around the world – from the nuclear industry, nuclear engineering, academia, and the world of diplomacy – and their voices represented anti-nuclear and pro-nuclear perspectives. The two volumes served as a grand debate for the entire subject of nuclear power.

Beyond the *Dædalus* volumes, the Global Nuclear Future project has focused on two large areas: the current and future status of the Nuclear Non-Proliferation Treaty given the expansion of global nuclear power, and also how the combination of nuclear technological innovations and new business model concepts can lower the risks involved with the spread of nuclear power. For example, how do you prevent incidents such as Fukushima? In that case, we have gone to Japan to discuss with the Japan Atomic Energy Agency how they can deal with independent regulation of the nuclear industry, something they had not done prior to Fukushima.

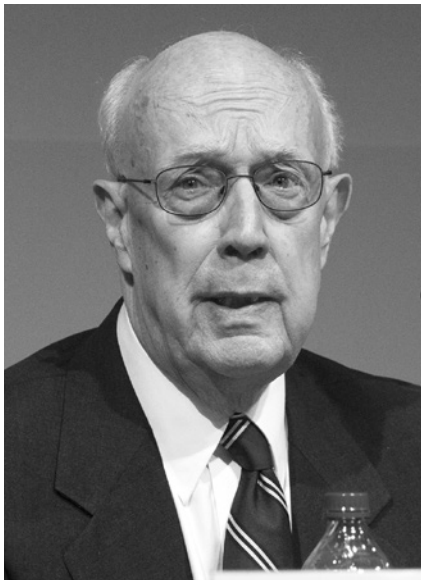
The project has published many publications: *Shared Responsibilities for Nuclear Disarmament: A Global Debate*, by Scott Sagan; *Nuclear Collisions: Discord, Reform and the Nuclear Non-Proliferation Regime*, by Steven Miller; *The Back-End of the Nuclear Fuel Cycle: An Innovative Storage Concept*, by Stephen Goldberg, Robert Rosner, and James Malone; *Nuclear Reactors: Generation to Generation*, by Stephen Goldberg and Robert Rosner; and *Lessons Learned from "Lessons Learned": The Evolution of Nuclear Power Safety After Accidents and Near Accidents*, by Ed Blandford and

Michael May. You can infer from the titles the span of our interests. We have also been involved in the preparatory conferences to the Nuclear Non-Proliferation Treaty negotiations, and we have had regional workshops in the places where nuclear power is being actively discussed, including Abu Dhabi, Singapore, Hanoi, Tokyo, and Hiroshima. And I confess, it has all been both a lot of fun and extremely interesting.

Where are we heading? In 2014, we are going to have a wrap-up workshop in Indonesia in collaboration with the School of Advanced Diplomatic Study, Paramadina University of Indonesia. Symbolically, that wrap-up will represent a transition toward the "locals" actually beginning to take the lead. We are not fully there, but it is an encouraging direction for Southeast Asia. And in collaboration with the Center for Non-Proliferation Studies and the Middle East Network on Nuclear Non-Proliferation and Disarmament, we are also preparing to run a one-week training workshop for journalists on nuclear-related issues, the aim of which is to make sure that journalists feel empowered to cover these subjects and to ensure transparency and accountability when talking about nuclear power. We can't hold a useful public discussion if the participants feel overwhelmed by the content.

Finally, we are looking at new studies, such as the regional impact of the Vietnamese nuclear program. And we are looking at the present state and the evolution of nuclear liability laws that concern how the spread of nuclear power can affect neighboring states. That is a topic that has not yet received much attention. Finally, we are thinking through the security risks posed by "insiders." These subjects may serve as the germs of new studies and new programs, perhaps even the next version of the Global Nuclear Future project.

# *The Alternative Energy Future*




## Robert W. Fri

*Robert W. Fri is a Visiting Scholar and Senior Fellow Emeritus at Resources for the Future. He is Cochair of the Academy's Alternative Energy Future project. He was elected a Fellow of the American Academy in 2010.*


The interesting thing about the Academy's Alternative Energy Future project is that it is not about energy; it is about people and institutions. If you expect, as we do, that the physical energy system is undergoing a major transition – chiefly to decarbonize – then that process requires major societal advancements in addition to the expected technological advancements. Our present system of energy is closely intertwined with how we function as a society, yet we know far less about the societal consequences of the energy transition than we do about the technology and economics of this change. That is what our project is investigating.

We are proceeding along two lines. One is applying the social sciences to accelerate and enable innovation in the energy system. The other is to understand how institutions and policy instruments that govern the energy system have to change alongside the energy transition. My cochair, Maxine Savitz, is going to talk about the first, and I will talk about the second.

# *The Alternative Energy Future*


## Maxine L. Savitz

*Maxine L. Savitz is retired General Manager of Technology Partnerships at Honeywell, Inc. She currently serves as Vice President of the National Academy of Engineering and Vice Chair of the President's Council of Advisors for Science and Technology. She is Cochair of the Academy's Alternative Energy Future project. She was elected a Fellow of the American Academy in 2013.*


**The work of the Alternative Energy Future project has shown us that the energy policy community and the social sciences community need to talk and work together, and policy-makers must have improved access to existing social science research on energy.**

This month marks the fortieth anniversary of the Arab Oil Embargo, an embargo that doubled oil prices in the United States. Though gasoline was still well under a dollar per gallon, even with the price increase, the embargo triggered fuel shortages and long lines at the gasoline pumps. Moreover, it made us aware of what kind of energy we used to heat, cool, and light our buildings and offices; run our factories; and move freight and ourselves. The efficient use of energy in buildings, industry, and transportation became one of the solutions to these growing concerns. By efficient use of energy, I mean providing the same service with less energy. Energy efficiency has since made major contributions to our needs, but it has not yet reached its potential.

Recent studies by the National Research Council, McKinsey, and Deutsche Bank have identified enormous potential for further improving the efficiency of energy use in the United States through a combination of technology adoption and policy actions. Such a combination could reduce energy use from what we currently use by up to 30 percent by 2030 in all regions of the economy, and especially in buildings and in transportation. But significant hurdles remain, many of which have little to do with the technology and cost and performance, and much more to do with the lack of understanding of how the technologies succeed, first in the marketplace and then in the hands of the public. These challenges inspired the Alternative Energy Future workshops that we held beginning three years ago. The workshops included a number of participants from industry, including the head of Honeywell's Buildings Automatic Controls, who reported that 80 percent of the people who buy a programmable thermostat, which is three or four times the cost of the little round ones, never use them. That incredible investment in dollars, technology, and energy is going unused.

In November 2010, the president's Council on Science and Technology issued a report to the president on accelerating the pace of change in energy technologies through an integrated center for energy policy. I cochaired that report with now-Secretary of Energy and Academy Fellow Ernie Moniz. One of our recommendations was that the Department of Energy, with the National Science Foundation, should initiate a multidisciplinary social science research program that will provide critical information and support for policy development that advances the diffusion of alternative energy technologies. The research program should fund experts from the physical sciences, engineering, economics, sociology, public policy, international relations, business, and the other disciplines. Questions requiring rigorous study include: how and why are advanced energy technologies, both on the demand and supply side, accepted or rejected by the consumers or suppliers? What are the barriers to adaptation and adoption? Will the public accept a specific technology? What market conditions are needed for technology to compete?

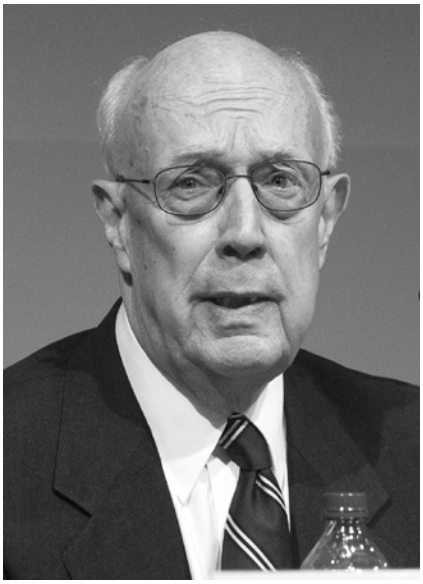
After the report was issued, Bob and I visited with Steven Koonin at the DOE and Cora Marrett at NSF to discuss implementing this recommendation. That meeting led to funding from both agencies for us to start the Academy's Alternative Energy Future study. Over the last three years, we have held several workshops, published two issues of *Dædalus*, and authored the report *Beyond Technology: Strengthening Energy Policy Through Social Science*. This work has shown us that the energy policy community must recognize the value of social science, and social scientists must develop a better

understanding of the needs of the policy community. The two communities need to talk and work together, and policy-makers must have improved access to existing social science research on energy and language that energy policy-makers can understand. Again, it is about communication.

Collaboration between the two communities should focus on and prioritize specific research and energy needs. With continuous support from NSF, we held a workshop in Washington, D.C., a year ago that brought together investigators from government, academia, and industry to discuss novel approaches to understanding and overcoming some of these barriers, and to explore the lessons learned. An additional objective of that workshop was to explore how the goals could be reinforced through the creation of a research coordination network that would be composed of people who were being funded currently by both the DOE and NSF, a group you could count on less than two hands. So, we decided to work with seven projects that were underway. These included a project at Stanford, funded by ARPA-E, which was the only social science project funded out of 3,900 total project applications. The Energy Behavior Institute at the Stanford Precourt Institute for Energy has twenty research projects underway, and two-thirds of the staff and researchers are social scientists.

We have selected projects related to photovoltaics, for acceptance by both utilities and consumers. And the Climate Decision Making Center at Carnegie Mellon, funded by NSF, is studying the utilization of social science research on sustainability and energy. The work will be enriched by participation of a project from Columbia University, the Woodrow Wilson Fund, and Avista Corporation, a utility in the Northwest that gets the deliverers of energy involved. We met with John Holdren and others at the Office of Science and Technology Policy, in addition to other staff in the Executive Office of the President, and there was agreement on the goal that this research coordination network be used to design and test methods to evaluate how effectively this research is being integrated into existing energy policies – sort of as test cases. Holdren encouraged our work, and we have gone on to talk to Dave Danielson, Assistant Secretary of DOE for Efficiency and Renewables, who requested a two-page proposal and for us to meet with some of his staff.

But we have not limited our partners to the federal government; states have been active participants in these issues as well. This summer, the New York State Energy Research and Development Authority (NYSERDA) issued a solicitation for New York State pilot projects involving engineering and social science, with awards totaling $400,000. And we have been talking with NYSERDA about holding a workshop with their grantees, along with federal grantees, to evaluate how these projects are going and to allow the grantees to communicate with each other. It has been a fascinating journey so far, and I want to thank John Randell and the staff at the Academy for their tremendous support throughout the whole thing.



## Robert W. Fri

**If the transition in the physical system of energy is going to take decades, how do you create a policy framework that will stand up over time and continue to push the system in the direction that you want it to go?**

As I mentioned, the second element of the Alternative Energy Future project involves institutions and policy. The premise is that the existing institutions and policies in place to operate and govern the energy system are built for today's energy system, not for the system we would like to have thirty or fifty years from now. So what *should* those policy instruments and institutions look like?

In order to begin to get a grip on this somewhat fuzzy question, we first tried to describe the nature of the issues in more detail in one of our issues of *Dædalus*. A number of authors contributed wonderful articles exploring a variety of questions, such as in what institutional setting does the renewable energy industry flourish? (I will tell you, it has very little to do with whether renewable energy resources are anywhere nearby.) Or how can you negotiate international arrangements for climate change when you cannot achieve a grand bargain? In what ways do existing institutions hinder the effectiveness of economic incentives like cap and trade, which strives to change the energy system? One essay also argued that Elinor Ostrom's idea of a polycentric system of governance may be more appropriate for the new energy system than the hierarchal system of government that we have today, and another essay looked at the question of larger-scale sustainability and what constraints that puts on the energy transition.

Following this broad exploration, we decided to take one of these issues and dig into it more deeply. We chose policy durability and asked the following key question: if this transition in the physical system of energy is going to take decades, how do you create a policy framework that will stand up over time and continue to push the system in the direction that you want it to go, but that is also sufficiently adaptable and sufficiently capable of taking onboard and using the vast amount of new information that will be developed over the period? An extraordinary group of scholars faced this question in our Alternative Energy Future workshop held earlier this year, and we drafted a consensus statement. We agreed that despite the complexity of the problem, and the need for more research, we knew enough to list three or four necessary conditions for policy durability that are actionable by policy-makers today. So we have an immediate, actionable plan and we have troops on the ground to execute it, in addition to a conceptual research agenda.

Both of these approaches have resulted in a particularly good reception in virtually all quarters. These issues resonate with policy-makers, who worry about how to keep the show on the road. They also resonate with a research community that is interested in contributing their research to these kinds of issues, and who also want to ensure that policies and infrastructure support their innovations. There has been some public interest in the project, too, with ideas from the project appearing in both *The New York Times* and on *The Huffington Post*. We are going to push ahead with these ideas, and there are now two main tasks in front of us. One is to develop an actual follow-on research agenda on policy durability with some of the scholars who attended the earlier workshop, and to try to get that research funded. And the other is to organize the symposium early next year that we hope will bring together environmental program officers of the Energy Foundation, the Rockefeller Brothers Fund, the Sloan Foundation, and the Bullitt Foundation and encourage them to integrate the tools of social science in their programs.

We think these paths that we have been following have a future. We started the project with a simple premise, that the society is going to be affected by the transition in physical energy systems, and exploring that premise has produced some very interesting and useful issues and opportunities. We have been very pleased with the favorable reception we have received so far, and hope that the policy-writing and research continues in new communities, and that we may continue to follow this trail to see where it leads.

# Humanities, Education, and Social Policy

## *Commission on the Humanities and Social Sciences*


### Philip Bredesen

*Philip Bredesen served as the 48th Governor of Tennessee from 2003 to 2011. He is a member of the Academy's Commission on the Humanities and Social Sciences and the Lincoln Project. He was elected a Fellow of the American Academy in 2012.*


The Commission on the Humanities and Social Sciences is much newer than the other projects you have heard about today, but it is already creating a model for projects the Academy could pursue in the future. The genesis of the Commission was about two-and-a-half years ago, when two senators, Lamar Alexander and Mark Warner, and two members of the House of Representatives, Tom Petri and David Price, from two different parties in each case, wrote the Academy a letter. If I can paraphrase, the letter acknowledged the necessity of STEM education – science, technology, engineering, mathematics – in the United States today. At the same time, the letter stressed that we cannot lose sight of the importance of the humanities, which have always been the other leg that education in this country has stood upon. The letter then posed the question: what steps can federal, state, and local government, universities, foundations, educators, and others do to support the humanities in the United States?

The American Academy draws about half of its membership from the academic world, including administrators and college presidents as well as highly respected faculty members. It is an extraordinary group of people possessing unprecedented convening power. The Academy created its Commission on the Humanities and Social Sciences and held three group meetings, followed by six regional meetings around the country, to discuss the questions raised in the letter. The regional meetings were fascinating to me. While national education policy discussions focus primarily on STEM right now, we found there is actually an enormous amount of interest in the subject of the humanities, with initiatives and activities flying just below the radar in many different communities.

**We need the humanities for our nation's defense and for the strength of the economy. We need the humanities to help produce the thoughtful and critical-minded citizens that our democracy needs to thrive. And as individuals, we need the humanities to help us lead more fulfilling lives.**

In the discussions we have had as a Commission, people have generally spread themselves in their approach along two major axes. The first axis concerns exactly how you justify the humanities. Members of the Commission tended to view the value of the humanities as principally either *instrumental* or *intrinsic*. The instrumental crowd argues that the humanities are critical to the future of our nation's creativity, economic success, and security. Karl Eikenberry, former U.S. Ambassador to Afghanistan, retired U.S. Army Lieutenant General, and a member of the Humanities Commission, has spoken quite eloquently about the problems the military will face without citizens trained in languages, cultural and regional studies, history, and so forth. The intrinsic group, on the other hand, argues that the humanities derive their value not from their measurable economic or political output, but from their innate intellectual worth.

The second axis concerns the issue of whether the Commission ought to focus on asking Congress for funding, or whether it ought to focus instead on taking a moral stand about the importance of the humanities.

Our discussions resulted in the first report of the Commission, published last June, *The Heart of the Matter: The Humanities and Social Sciences for a Vibrant, Competitive, and Secure Nation*. I have to say that it struck a chord with the nation more than even I thought it would, attracting an enormous amount of interest from academics, journalists, and the public. We are already beginning to see proposals that were introduced in *The Heart of the Matter* starting to take shape on university campuses, and the Commission is now moving toward phase two of the project, which is to build off this positive beginning with the kind of follow-on work the report calls for.

I would like to leave the specifics of our work and talk for a moment about the Commission on the Humanities and Social Sciences as a model for the workings of the American Academy itself. When I entered office as the Governor of Tennessee, I thought that engaging the academic community in addressing public policy problems was a no-brainer, something I was absolutely going to do. I live and work in Nashville, and Vanderbilt University was an obvious resource. But I was a complete failure at engaging the academic community in this way. A number of factors contributed to this failure: different time scales, the economics of the university, and simply how the state operates. And frankly, I was looking to bring knowledgeable people together who could help create a solution; what I often got was a lot of people who had already carved out their own solutions and were interested in promoting their answers.

Until recently, the American Academy had been a mostly quiet academic institution. But I believe that this organization has tremendous potential to provide some of the policy background and intellectual policy work that this country so badly needs. The United States must engage its immense academic resources in creating solutions to the problems it faces, more deeply than what goes on in a D.C. think tank. The Academy possesses, of course, an abundance of quality thinkers in its membership, but also a convening power through which we can advance this important process. Remember, this organization was founded by people who were up to their necks in the public policy issues of their day. Benjamin Franklin, John Adams, and Thomas Jefferson were not isolated thinkers, but were deeply involved as actors in the policy-making process. I think it would be wonderful if the Academy, in a way that is suitable for the modern era, returned to these roots, reuniting America's policy questions with the resources of the academic world in a thoughtful and constructive way. The Commission on the Humanities and Social Sciences represents an opportunity to get started, and to do so effectively.

I want to conclude with a request. This is obviously a group of very smart people, people who are highly respected leaders and shapers of opinions in their communities and institutions. I would ask of you, as you leave here today and in the years ahead, to be a proselytizer for the importance of having two legs for the educational system in our country to stand upon. We need the humanities for our nation's defense and for the strength of the economy. We need the humanities to help produce the thoughtful and critical-minded citizens that our democracy needs to thrive. And as individuals, we need the humanities to help us lead more fulfilling lives.

# *Commission on the Humanities and Social Sciences*


## Annette Gordon-Reed

*Annette Gordon-Reed is the Carol K. Pforzheimer Professor at the Radcliffe Institute for Advanced Study, the Charles Warren Professor of American Legal History at Harvard Law School, and a Professor of History at Harvard University. She is a member of the Academy's Commission on the Humanities and Social Sciences. She was elected a Fellow of the American Academy in 2011.*


Serving on the Humanities Commission, and seeing the dedication that people from all walks of life have poured into this project, has been one of the most exciting and meaningful experiences of my life. The Commission includes scholars, university presidents, politicians, musicians, architects, and filmmakers – George Lucas, for example, participated in every meeting because he is one of the many members who are so deeply committed to the idea that the humanities and the social sciences are integral parts of any society.

Many of us have children, and many have children now graduating from college. Everyone is interested in finding a job. People are thinking more instrumentally about education than they may have in the past. The relevance of the humanities, social sciences, and liberal arts to our modern economy has been publicly called into question. But others, Steve Jobs is one example, have stressed the importance of the interplay between the creativity of the liberal arts, humanities, and sciences.

I am a member of the Board of Trustees of Dartmouth College, a college that focuses on the liberal arts. Dartmouth features a very strong engineering component as well, but it is viewed as a part of the liberal arts. The engineers there believe that the arts and humanities are vital to the training of their student engineers. At Dartmouth, we hear from people all over the world who are interested in the model of education that we have in the United States. The countries that we think of as focusing primarily on the STEM disciplines, China, for example, are realizing that there is something missing when the focus is all on the so-called hard sciences, that there is something to be said for the way we do things here in our system of higher education, which is really the envy of the world. People come from all over to study in the United States, and they learn that our university model is not only concerned with science, but also with the arts and humanities.

We divided the Commission up into groups, each with a different area of focus. We had groups focusing on K – 12 education, on two- and four-year colleges, on research and the graduate arm of the university system, and on cultural institutions as well, since humanities education also takes place in museums, cultural centers, and elsewhere. I was in the K – 12 section because I think this is a critically important area, not only for the humanities and social sciences, but the sciences as well, which we do not view in opposition to the humanities.

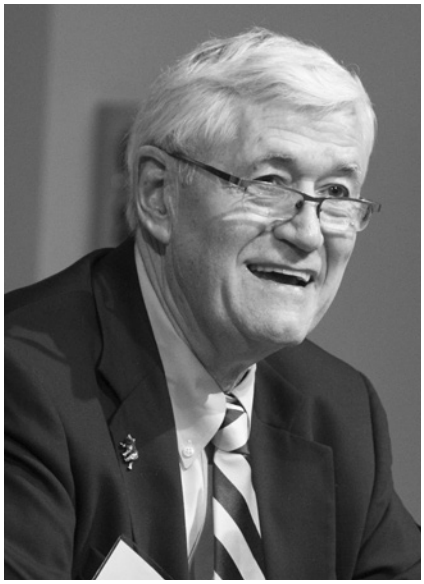
But K – 12 education is a difficult process to grapple with, and one of the things that we discussed is the system of localized control over education curricula. We don't all agree about what should be taught – I am from Texas, and I am often called upon to explain my home state's views on education to people who do not live there. We don't all agree about what it means to be a citizen. Where does that leave civic education? And with a balkanized K – 12 education system, how can we create one central message that we would like to communicate? We can't, and that is why we have engaged not only the members of the Commission, but we went out and talked to regional and state humanities councils, to involve people from different regions of the country and benefit from their understanding of the process as

**Our report, *The Heart of the Matter*, has been very well received. But beyond the positive feedback is a shared aspiration to use the report as something on which to build. We are hosting new regional meetings to try to engage still more people in this process. This should not be done from the top-down; ideas must come from ordinary citizens as well.**

they have experienced it. The whole subject of history – my own field – is contentious, and historical interpretations vary widely by region. Citizens are today discussing the Fourteenth Amendment in many contexts, about what the history of the amendment means, about state authority, about how it informs our response to the government shutdown, about what the president can and cannot do. Having an educated citizenry is a prerequisite for any kind of substantive consideration of these issues. The discussion may not give us the final answer, or the best answer, but participating in these types of discussions is part of what it means to be a citizen in a democracy.

Our report, *The Heart of the Matter*, as was mentioned before, has been very well received. But beyond the positive feedback is a shared aspiration to use the report as something on which to build. We are hosting new regional meetings to try to engage still more people in this process. This should not be done from the top-down; ideas must come from ordinary citizens as well. I have been enormously gratified by my participation on the Commission, and I look forward to continuing its work. Please, join us with your ideas, with your hopes and your proposed solutions about what we should do, because we are truly in this together.

# *The Lincoln Project: Excellence and Access in Public Higher Education*




## Robert J. Birgeneau

*Robert J. Birgeneau is Chancellor Emeritus and Silverman Professor of Physics, Materials Science and Engineering and Public Policy at the University of California, Berkeley. He is Cochair of the Academy's Lincoln Project and a member of the Academy's Commission on the Humanities and Social Sciences. He was elected a Fellow of the American Academy in 1987.*


The Lincoln Project is at a very different stage from the Humanities Commission, which I also serve on. This project is at its very beginning. We held our first meeting here at the Academy only days ago, and it was an exciting and stimulating meeting. I am particularly pleased to have as a cochair of the Lincoln Project Mary Sue Coleman, President of the University of Michigan.

I am sure that I do not have to explain to anybody in this room that public research universities have faced extraordinary financial challenges over these past six or seven years. Unprecedented in history, the cuts in state funding that we have received are much worse than those that occurred during the Depression. This has been a singular time for public education in the United States. To particularize the state disinvestment in terms of one institution that I understand well, when I started as Chancellor of the University of California, Berkeley in 2004, the state provided 29 percent of our total budget. When I finished as Chancellor last May, that number had plummeted to 11 percent.

If the compact that Governor Schwarzenegger had signed at the time of my recruitment was honored, then our funding from the state this past year would have been $590 million. Instead, it was $240 million; we lost $350 million out of our budget over a very short length of time. To put that in human terms, this means that the state withdrew the salaries for more than one-half of our 8,000 staff who support the educational enterprise. Clearly, this presented an extraordinary challenge.

Why should we care about this? Why do public universities matter? The motto for both UC Berkeley and the Lincoln Project is "Access and Excellence." To put it succinctly, the greatest challenge facing our country in higher education is whether or not we are going to be able to maintain both access and excellence in our great public universities. I will not go through the details of the financial models for public research and teaching universities, but suffice it to say, I have no doubt that we could maintain access if we sacrificed the excellence of our institutions, as we could also maintain excellence by sacrificing public access. However, our country simply cannot afford to compromise on either if we want to sustain both our economic preeminence and our democratic society.

If you look at the top ten comprehensive public research and teaching universities in the United States, you will see that in the last year, they educated about 375,000 undergraduate students. This includes just the top ten universities! Clearly, this is an enormous number of students, and whether it is Michigan or Berkeley or Colorado, these under-

graduates are typically the very best students in their respective states. These institutions are providing an education to our country's most talented young people state by state (excluding, of course, the very small percentage of top students who go off to our elite private universities). Furthermore, these students are diverse in every sense of the word.

I will again give Berkeley as an example because I know this school best: currently on the Berkeley campus, we have 4,000 undergraduates whose family incomes are $20,000 a year or less. Four thousand is the size of the entire undergraduate body at a representative private university like MIT. Nearly every one of these low-income students will be the first in his or her family to graduate from college. When these students graduate they will elevate not just themselves but, most often, their entire families along with them. Furthermore, close to 90 percent of these 4,000 undergraduate students at Berkeley are people of color. Public universities therefore represent an extraordinary mechanism for social mobility in our country, most especially for underrepresented minorities. Frankly, we could solve our economic problems at Berkeley simply by reducing by a factor of two the need-based financial aid that we offer to low-income students, and instead devoting those funds to staff and faculty salaries. However if we did that, we would be betraying our mission as a public university. We are not going to do that; and this defines our challenge.

Many of us, perhaps myself most prominently, believe that the progressive disinvestment in higher education by the states across the country is irreversible. This conundrum is not going to be solved through repeated trips to state capitals pleading for a return to a past system of investment. We believe that the model for the support of elite public higher education is broken, and we need a new model – a model that will involve, among others, the federal government not just supporting research, but supporting operations directly. The U.S. federal government does not now support the operations of its great public universities; this is in contrast with the situation in every single other country with which we compete economically. We both recognize and appreciate the phenomenal support that public universities have received from private philanthropists. Indeed, it has been private philanthropy that has saved Berkeley over these past six years. However, we also believe that corporate America must step up to the task; their support so far has been disappointing. In California, at least, if our major high-tech corporations simply repatriated 1 percent of the money annually that they are holding offshore and dedicated it to higher education this would solve our problem. Of course, we also need the state governments to act more responsibly.

To address the plight of higher education, most especially in our country's great public teaching and research universities, we have put together a broad-based committee. Because this topic is a public policy and political challenge, our committee includes politicians like Phil Bredesen, the former Governor of Tennessee, former Senator Kay Bailey Hutchison, and former Governor of California Gray Davis. We have also enlisted business people, and we have a number of current and former university leaders, from both public and private research universities. In addition, we have a number of talented data experts because we must make our case convincingly. This cannot be an exercise in whining; it has to be fact-based, with reliable historical data and projections into the future. Finally, we have communications specialists because we recognize the challenges that public higher education has faced in communicating properly all aspects of our enterprise to the various sectors of society.

**The greatest challenge facing our country in higher education is whether or not we are going to be able to maintain both access and excellence in our great public universities. . . . The goal of this project is direct political and social action that will result in genuine and lasting reforms to the model for the support of public higher education in the United States.**

Looking ahead, we might very much like to explore these challenges in an issue of *Dædalus* of our own, but if we stopped there, we would have failed. The goal of this committee is direct political and social action that will result in genuine and lasting reforms to the model for the support of public higher education in the United States. While we must first provide the basic information and make our case convincingly, we will follow up this scholarly work by playing a direct, active role in support of public higher education in the corporate, philanthropic, state, and federal government sectors.

# *Stewarding America*


## Norman J. Ornstein

*Norman J. Ornstein is Resident Scholar at the American Enterprise Institute for Public Policy Research. He is Chair of the Academy's project on Stewarding America. He was elected a Fellow of the American Academy in 2004.*


**The Stewarding America project is an attempt to look at the future of civil society in America – the pervasiveness of the sense of the common good – creating or enhancing the notion that we are all in this together.**

The Academy was created to provide a forum for leading scholars, members of the learned professions, and leaders in government and business to work together on behalf of the democratic interests of the republic. The project on Stewarding America is right in the wheelhouse of that mission and charge. Really, the Stewarding America project is an attempt to look at the future of civil society in America, the pervasiveness of the sense of the common good, creating or enhancing the notion that we are all in this together.

When we started this project, I had just finished a book on the state of our political system with my coauthor and Academy Fellow Tom Mann called *It's Even Worse Than It Looks*. We just printed the paperback edition and I should have called it *It's Even Worse Than It Was: A Year Later*. All of us know the challenges we face in an era of partisan and ideological polarization; and during the present government shutdown, these challenges are very palpable. Now, frankly, if we only had to contend with ideological and partisan polarization, which we have experienced many times in American history, we could overcome that. There are ways in which you can find a compromise. Many issues are not ideological in nature; many of the issues we have been discussing here this morning are examples of things on which we can find common ground. But what we have now is a tribalism where if you are for it, I am against it, even if I was for it yesterday.

A couple of weeks ago, I was struck by a segment on comedian Jimmy Kimmel's late-night show in which an interviewer took to the streets and posed to strangers, "Which do you support, Obamacare or the Affordable Care Act?" We met a group of people who replied, "Obamacare, that's awful, it'll destroy the country and the economy; it's socialism. The Affordable Care Act is wonderful." That example may tell us something about the state of civic and other education in the country, but it also tells us that labels matter now much more than they did before. That is a terrible problem, and it is combined with a series of other deep challenges we face.

We have witnessed the decline of the public square. When I and many of you grew up, Americans shared a common set of facts. We tended to get our information from the same small number of sources. There were plenty of problems with that. There were issues, including race, that for many decades were ignored or treated unfairly in that public square; but the point is, if you have differences in viewpoints but share a common set of facts, you can then argue constructively from there. Today, rather, we cannot agree even on a starting point. How can you deal with the problem of climate change, as we have discussed today, if a sizable share of your public and political actors believe that it's a hoax? You cannot even begin to discuss whether a regime of regulation, of a carbon tax, of cap and trade are appropriate, or how fast you ought to move and at what levels. You cannot even talk to each other.

This impasse also has roots in the recent and dramatic change in the role of money in American life and politics. During last year's Induction weekend, Jim Leach, then chairman of the National Endowment for the Humanities, gave an extraordinarily eloquent and powerful discussion of the post – *Citizens United* world. We have been there before; it was called the Gilded Age. We are moving to a new Gilded Age, one that distorts priorities and interests in directions that do not answer to the common good. We have seen a dramatic coarsening of the culture and discourse in this society. If you go on television and lie and get caught in the lie, the only lesson learned is that if you double-down on the lie, you will get your own cable television show or talk radio show, or if you are a political figure, donors will flood you with money and you become a hero or heroine to your base. Combine these standards of honesty with the decline in

civility and the dramatic growth in inequality and it is a challenge to be hopeful.

Neal Lane was talking earlier about the American Dream, how our children and grandchildren cannot necessarily embrace the idea that if you simply apply yourself, you can achieve your dreams. Strains of this disillusionment have begun to extend to the social fabric as well. Where I fear we are headed – and what I have seen the last few years – actually reminds me of the movie and the book that preceded it, *The War of the Roses*, in which there is such intent on destroying your adversaries or scoring political points that you are oblivious to the notion that you are destroying your own society along the way. This is our danger: when you have a monomaniacal focus on issues like sequesters, you cannot take into account the greater cost to society of ignoring the things that grow the economy, that grow the educational system, that prepare our children for the future.

In response, there are many institutions, organizations, and individuals focused on what we can do about it. The Bechtel Foundation, which helped fund this project, has studied citizenship. We decided that our particular focus would be on the role of institutions in stewarding America. William Galston and I edited the Spring 2013 issue of *Dædalus* on "American Democracy & the Common Good," which focused on American institutions in the public and political sphere: from the courts to the military, to the political institutions and the parties, to unions and corporations, to the nonprofit sector and journalism. We tried to look at the broader culture as well, what Deborah Tannen in her essay has called "The Argument Culture," and we looked at the history and tradition of compromise, trying to imagine how we can reestablish a public commons.

If you have not yet read this *Dædalus* volume, it is now available online, and I would urge you to read these essays because they are quite elegant and profound. But we also want to move toward an agenda of action; we need to engage leaders more than we have. Unfortunately, we are living in an era of populism, with an economy that has been stagnant, and where it is tough to find leaders in any institution who can command a broader level of public support. Some of our leaders, including a few in the military, have feet of clay. We need both a new generation of leaders and for an older generation of leaders to step up, to begin to shift the culture and change the institutions.

We are planning a conference that will focus on a plan of action for the future, and we hope to engage all of you – that is the role of the Academy. We are joined together with the founding members of the Academy – John and Samuel Adams and John Hancock, among others – to answer a call to action. We are stewards of this society. ■

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