

Induction Ceremony Presentations

On October 1, 2011, the American Academy inducted its 231st class of Fellows and Foreign Honorary Members at a ceremony held in Cambridge, Massachusetts. The ceremony featured historical readings by film producer **Kathleen Kennedy** of Kennedy/Marshall Company; author and literary critic **Denis Donoghue**, University Professor and Henry James Professor of English and American Letters at New York University; and poet and essayist **Rachel Hadas**, Board of Governors Professor of English at Rutgers, The State University of New Jersey. It also included presentations by five new members (their remarks appear below): groundbreaking researcher and leader in biomolecular engineering **Frances Hamilton Arnold** of the California Institute of Technology; **David Conrad Page**, renowned geneticist and Director of the Whitehead Institute at the Massachusetts Institute of Technology; **Sir Adam Roberts**, President of the British Academy and one of the foremost experts on international strategic affairs; **Annette Gordon-Reed**, Harvard University historian and Pulitzer Prize-winning author of *The Hemingses of Monticello: An American Family*; and **William I. Miller**, President of The Wallace Foundation. The ceremony concluded with a memorable performance by singer-songwriter and new member **Paul Simon**.



Frances Hamilton Arnold

Frances Hamilton Arnold is the Dick and Barbara Dickinson Professor of Chemical Engineering, Bioengineering, and Biochemistry at the California Institute of Technology. She was elected a Fellow of the American Academy in 2011.

What is Life?

Like many of you here today, I was born within a few years of the discovery of DNA's double-helical structure, a discovery that marked the beginning of a revolution in our understanding of life and how it has evolved. That scientific revolution, enabled by technology that allowed us to visualize and explain the molecular basis of life itself, has

we all seem to have an intuition (although not necessarily shared) for what is alive and what is not. We also admire at least some of its known examples.

In lieu of a definition of life, scientists and philosophers usually just make lists of its properties: for example, a living system obtains resources and energy from its environ-

The code of life is intricate, elegant, and stunningly beautiful. We do not know how to write like that; the best we can do is copy and paste sections and make small changes, maybe rearrange them a little. But we are learning quickly.

spawned another technological revolution. This biotechnology revolution is moving so quickly that some of us may live to see life synthesized from nonliving material, a new "origin of life" in the twenty-first century.

Recently I was asked to lead a conversation on the topic "What is Life?" for the benefit of some Hollywood producers and screenwriters looking for compelling storylines. (I'm from Los Angeles, after all, and scientists are storytellers, too.) Like art, and pornography, life is not easy to define. But

ment, and it can replicate itself. Most lists also include the ability to adapt, or evolve. These properties have never all been exhibited by a physical system created by man. This may soon change.

We have not yet created life from nonliving matter, but we are getting wonderfully or, perhaps to some, terrifyingly close. In 2010, scientists constructed the first wholly synthetic genome – the entire million-base genetic code of a simple bacterium – and used it to replace the genetic

code of a closely related organism. This semi-synthetic cell “re-booted”: it grew and reproduced as directed by its laboratory-generated genome.

The technological and scientific advances that enabled this feat have also allowed us to re-program organisms whose behaviors we want to control. For thousands of years humans used artificial selection to modify everything from corn to carrier pigeons. But recently, through genetic engineering, stem cell engineering, or what we now call “synthetic biology,” we have built remarkable new organisms that can convert renewable biomass to fuels and chemicals, organisms that can track down and annihilate pathogens, cells that can grow into desperately needed tissues and organs, or that could feed the planet’s rapidly growing population.

Under the pressure of natural selection, life has created amazing molecules and mechanisms needed for survival in an extraordinary range of environments. A few billion years of Darwinian exploration, innovation, trial and error, success and failure have generated a truly stunning array of solutions to the problem of life. Many of these solutions – often via the DNA that encodes them – can be lifted from their natural contexts and applied to human problems. Compared to any other engineering substrate, biology surely has the most diverse and creative “parts list.” It is also frustratingly unpredictable: we are still woefully ignorant of how to write new DNA code for desired behaviors. But, remember, we have only just recently started to try.

For moviegoers, it’s easy to tell a gripping story of science or scientist gone bad, the experiments that ran amok, the fatal combination of too much power and too little wisdom. It’s much harder to write a compelling tale of tragedy that never happened. But that’s our job. Scientists are optimists – why else would we devote so much effort to

devising intricate experiments to tease out new knowledge? We also continue to innovate, to solve problems, perceived and real. Our world is rife with potential tragedies: rapidly dwindling resources, new diseases that spread with frightening speed, the effects of global warming. The role of science in protecting our lives and our planet is crucial and dramatic. The pressure to find answers is real.

In this era of synthetic biology, I hope that we will look to life for inspiration, and not just a new opportunity for exploitation. The code of life is rich. Like a Beethoven symphony or the poetry of Whitman, it is intricate, elegant, and stunningly beautiful. We do not know how to write like that; the best we can do is copy and paste sections and make small changes, maybe rearrange them a little. But we are learning quickly. I hope that the life we write is beautiful, and that it supports and enriches our own.



David Conrad Page

David Conrad Page is Director of the Whitehead Institute, Professor of Biology at the Massachusetts Institute of Technology, and an Investigator at the Howard Hughes Medical Institute. He was elected a Fellow of the American Academy in 2011.

What We Don’t Know about Sexual Reproduction

I would like to discuss a subject that the learned membership of this Academy may not have spent much time considering: sex. I do not mean having sex. (I’m sure that many of you have thought about that.) I mean understanding – at a basic biological level – how our species propagates itself, by way of the process termed *sexual reproduction*.

Sexual reproduction is a brilliant scheme by which two adults – two prospective parents – each contribute half their genes to the making of an embryo and thereby a child. It is how we transmit our genome, our genes, from one generation to the next. Each of us is a product of sexual reproduction, whether by conventional insemination or by in vitro fertilization.

Outside the realm of science, it is commonly assumed that scientists collectively know or are about to learn everything about the physical world: that the era of discovery is coming to a close, and that we should now focus on practical translation of basic knowledge. Outside the realm of medicine, it is commonly assumed that physicians collectively know or are about to learn everything about the human body. Of course, this is not true in any area of science or medicine and is *especially* not true in the case of reproductive biology, the study of sexual reproduction.

Art, literature, music, and social science are as important as medicine and biology in understanding and conveying both the tragedy and the opportunity that surround our ignorance of sexual reproduction.

In America, fundamental, basic research on human reproduction is meager, it is diminishing, and it is at real risk of being blown off the scientific highway by the onward rush of biomedical research in other areas. Why should members of this Academy care? As I will illustrate, the immediate consequences of our ignorance regarding human reproduction are personal, impacting the lives of many in this room and beyond. The long-term consequences of our ignorance are global.

Consider infertility and contraception, two areas in which there has been an astonishing lack of progress in basic science in recent decades. One of every six American couples of childbearing age is infertile; yet the search for causes, for fundamental understanding of human infertility, is in a primitive, undeveloped state that we all would consider intolerable were we discussing heart disease, high blood pressure, or other disorders of older adults. To be sure, we have means of circumventing infertil-

ity – in vitro fertilization, donor eggs, donor sperm, and other methods of assisted or surrogate reproduction – but these merely bypass infertility’s root causes, which remain largely unknown and unaddressed. And be aware that the principal methods of bypassing infertility were pioneered abroad, or with private funding in the United States – not with federal dollars.

Let me turn to contraception, where there has been no fundamental scientific breakthrough in a half-century. To be precise, it has been fifty-one years since American society was introduced to, and ultimately

transformed by, “the pill,” the first drug to be prescribed for long-term use in a healthy person. Notably, the pill was developed with *private* funds in the United States and Mexico. In 1959, on the eve of the pill’s introduction, then-President Dwight Eisenhower told a reporter who inquired about contraceptives, “I cannot imagine anything more emphatically a subject that is not a proper political or governmental activity or function or responsibility.”

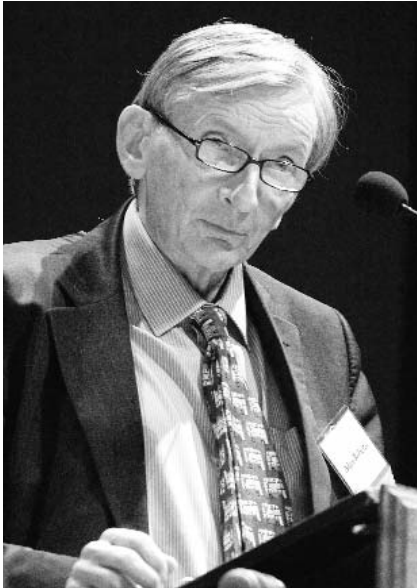
Today, the “male pill” – an old but appealing concept – awaits serious exploration, largely because of our fundamental ignorance of mechanisms underlying male reproductive function. Meanwhile, during the last half-century, the world’s population has increased from three billion to seven billion. In the circles in which I travel, the focus of discussion has shifted from population control to the consequences of its absence: climate change, and shortages of water, food, land, and energy. These are vast, global issues, but they have arisen one child at a time.

In focusing on infertility and contraception, I have only begun to touch on the issues arising from our ignorance of the mechanisms by which the genome is transmitted from one generation to the next. I have said nothing about other medical problems that persist in part because of this lack of understanding: miscarriages, birth defects, and various cancers. I chose this setting to raise the problems engulfing reproductive science because I believe this body can play an important role in their solution.

I believe that art, literature, music, and social science are as important as medicine and biology in understanding and conveying both the tragedy and the opportunity that surround our ignorance of sexual reproduction. You each have achieved prominence in an arena where the ultimate causes of this ignorance reside:

- Taboos against discussion of sexual reproduction and its consequences;
- The lack of political courage to address these issues through funding of education and research; and
- The failure to understand that progress in medicine still depends on basic discoveries whose practical implications are not immediately obvious.

Your talents are needed if we are to stimulate discussion, promote education, and support the research that will help your children, grandchildren, and future generations lead healthier lives, on a planet that can support them.



Adam Roberts

Adam Roberts is President of the British Academy, Senior Research Fellow in the Centre for International Studies at Oxford University, and Emeritus Fellow of Balliol College, Oxford. He was elected a Fellow of the American Academy in 2011.

The Social Sciences and the World

It means a great deal to me to be invited into the company of such a distinguished group of colleagues across the range of academic subjects. I have held the American Academy of Arts and Sciences in awe for precisely fifty years. In 1961, when I was still an undergraduate student at Oxford University, and much concerned about nuclear weapons, I came across the magnificent issue of *Dædalus* on the subject of arms control.¹ It was a multidisciplinary eye-opener. It showed me that questions that were the subject of hot debate (in which I took part, no doubt heatedly) could also be analyzed calmly and perceptively. I was particularly

¹ *Dædalus* 89 (4) (Fall 1960).

impressed not just by the variety of points of view represented, but by the ways in which nuanced positions seemed to make more sense than the reach-me-down standard formulae of much political debate. That issue of *Dædalus*, along with Hedley Bull's excellent book *The Control of the Arms Race*, contributed to my decision a few years later to go into graduate studies in international relations, which I did in 1965 at the London School of Economics.

Today, a half-century later, the international problems that we face stand in need of the same kind of calm, perceptive, and innovative analysis. The social sciences have a key part to play in this.

In respect of many contemporary problems we are all inheritors of one – never completely dominant – tradition in the social sciences and in public life more generally of seeking standard answers that can be applied across the board, to any country. This has been evident, for example, in that tendency in political science to identify the requirements of the good life and then to work out the political system most conducive to it. From there it is but a step to believing that it is good for all the peoples of the world, and even that it can be imposed by the sword.

This is no new tendency. In my country, Jeremy Bentham (1748–1832), one of the great figures of progressive social thought and indeed the inventor of the word *international* and the term *international law*, was much given to seeking universalist solutions. He proposed radical democratic reform for Britain, and indeed for everywhere else as well. He had a walking partner, with whom he went on several three- to four-hour walks in London before breakfast, whose name will be familiar to you: John Quincy Adams, President of the American Academy from 1820 to 1829. In May 1817, Adams – at that time Minister to the Court of St James's – made it clear that he was sus-

picious of the way Bentham regularly upheld the United States as a model for Britain, because the two countries had different starting points.² So here was a nice reversal of roles, with the Englishman tending toward reckless universalism, while his American friend urges caution and cultural relativism.

A few years later, in respect of Libya – which, then known as Tripoli, was almost as much a problem in his lifetime as it is now – Bentham conceived of a plan to use U.S. military force to liberate the country from reactionary and autocratic rule. Sound familiar? In January 1823, he drafted a letter to John Quincy Adams, who by then was U.S. Secretary of State (1817–1824) as well as, rather more important, President of the American Academy. Bentham's letter said:

a body of men, regularly trained, [and] disciplined . . . would be an indispensable requisite. This would be needful to serve as a basis or centre of union, a *point d'appui*, a moving fortress, to which volunteers might come in and attach themselves. With the interests and affections of the people in their favour, . . . small indeed is the number that would be sufficient.³

This sounds awfully like Rumsfeld-lite. Its fundamental intellectual error lay in its belief that the existence of opposition in Tripoli meant that the people there wanted modernization, rationalization, democracy, and a strong central state on Western models. I say this not to criticize the ongoing

² C. F. Adams, ed., *Memoirs of John Quincy Adams, Comprising Portions of his Diary from 1795 to 1848* (Philadelphia: J. B. Lippincott, 1874–1877), vol. III, 539.

³ Draft letter of Bentham to John Quincy Adams, written between January 10 and 13, 1823, and apparently never sent. Philip Schofield, ed., *Securities against Misrule and Other Constitutional Writings for Tripoli and Greece* (Oxford: Oxford University Press, 1990), 149. This volume is part of the excellent series *The Collected Works of Jeremy Bentham*, sponsored by the British Academy.

NATO operation in Libya, with which I have much sympathy, but to warn against some of the facile assumptions about what comes after such actions. Indeed, Bentham took this to the point of comedy when he proposed to Adams, in a letter purporting to be from a representative of Tripoli, that the reformed state's motto should be "the greatest happiness of the greatest number" in

globalization is sweeping the world and creating a common culture. We saw another example in the early reaction to the Arab Spring. I yield to no one in my admiration for civil resistance, but I worried about the easy assumptions that the outcomes might be similar across the Arab world.

This is definitely *not* to say that certain peoples are not capable of building a mod-

ern democratic system, nor is it to say that cultural relativism rules supreme. Nor indeed am I suggesting that we should never seek to spread our ideas and customs. Political and social thought crosses borders as easily as the wind and weather. But it is to say that change has to come from within societies. It may be helped from outside, but any help has to work with the grain of the society concerned. I have sometimes called this a process of induction, and I hope we can celebrate that larger meaning of the term as well as the induction of Fellows in which we are taking part today.

essary that they have local legitimacy – something that has proved notably hard to achieve in Iraq, Afghanistan, and many other countries.

At a time when understanding foreign societies is so necessary – and is apparently in short supply at the highest levels of government – we need the social sciences and the humanities more than ever. The British Academy has been waging a campaign to ensure that, in the perfect storm of change now happening in higher education in the United Kingdom, the very strong claims of the social sciences and humanities will be heard. We are pressing hard on all fronts, but are especially concerned with two issues, both of which are also causes of concern here in the United States. The first is the lack of adequate provision for the support of postgraduate students: this will be an increasingly severe problem in England as students complete their first degrees with a burden of debt around their necks. The second is the situation regarding the study of foreign languages. In the United Kingdom, frankly, the situation has become dire. In both the United Kingdom and the United States we risk becoming nations of monoglots in a world of polyglots.

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Arabic.⁴ Sadly, there is no evidence that Bentham's letters to Adams were ever posted.⁵ We can assume that Adams, had he received them, would have been duly skeptical.

This episode is worth recalling because the problem that it exemplifies – of assuming that other societies think like we do, and want exactly the same things – is still very much with us. It is part of the intellectual failure that has marked aspects of the international campaign against terrorism of the past ten years – and it has been a problem in the United Kingdom every bit as much as in the United States. The problem has been made worse by the seductive claims that

This conclusion draws on a tradition in the social sciences – one distinct from the universalist tradition I mentioned earlier. It is a tradition that accepts that different peoples, societies, and states have undergone very different historical experiences, view the world and their place in it very differently, and indeed react to globalization differently. This is a tradition that recognizes that it is not enough for political systems, or military interventions, to have legitimacy from on high, whether from the U.S. government, from international coalitions, or from the UN Security Council. It is also nec-

I'm delighted, and as a new Fellow proud, that the American Academy – which is 122 years older than the jumped-up British Academy – has set up its new Commission on the Humanities and Social Sciences, under the direction of Leslie Berlowitz. I'm especially pleased to see that the new commission is absolutely not structured in a way to suggest that the humanities and social sciences should be seen as counterposed to the physical and biological sciences. In the last few turbulent years, inasmuch as we at the British Academy have achieved anything to protect the subjects we champion, it has been by working very closely with our colleagues in the Royal Society, and indeed sending a joint submission to government

⁴ Draft letter purportedly from Hassuna D'Ghies to John Quincy Adams, written by Bentham between January 13 and February 2, 1823, and apparently never sent; *ibid.*, 166 – 167.

⁵ *Ibid.*, Editorial Introduction, xxxi – xxxii. The excellent Online Adams Catalog of the Massachusetts Historical Society does not contain any indication that the letters were sent; <http://www.masshist.org/adams/catalog>. (Further research conducted by the author at the MHS Library on October 3, 2011, provided new evidence that these letters about Tripoli were never actually sent to John Quincy Adams.)

indicating the common requirements that need to be followed in supporting research in our various subjects.

And that is the point on which I conclude. The great problems that modern societies face – from environmental change to the obesity epidemic, from development in the postcolonial world to the control of weaponry – all these issues require the application of the full range of specialisms and skills represented in this great Academy and that were evident in that issue of *Dædalus* I read fifty years ago. I'm honored to be a member.



Annette Gordon-Reed

Annette Gordon-Reed is Professor of Law at Harvard Law School; the Carol K. Pforzheimer Professor at the Radcliffe Institute for Advanced Study; and Professor of History at Harvard University. She was elected a Fellow of the American Academy in 2011.

Why the Humanities and Social Sciences Matter

I was deeply honored to learn that I had been chosen to become a member of the American Academy of Arts and Sciences, and I feel doubly honored to be given the opportunity to say a few words at this induction ceremony. This organization has had an illustrious history since its founding in 1780 by some of the most prominent figures in American history, most notably John Adams, the American revolutionary and the nation's second president. It is humbling to have my name included on the roster of the distinguished people who have been members of the Academy over the years, including my fellow inductees.

Founding the Academy was an act of hope, on the heels of another supreme act of hope, when the American colonies decided to declare themselves an independent country just four years before this Academy came into existence. What a daring thing to do: to predict and believe that the new nation would cultivate scholars, scientists, and business leaders to rival those found in Europe. Though hope was at the foundation of their belief, Adams and his cohort understood that hope without action would not be enough. The development of scholarly, artistic, and commercial life in America could not be left to chance. Cultivation of each of these endeavors was required if the United States was to become and remain a great nation. As France had done when it created the French Royal Academy of Arts and Sciences, the establishment of the American Academy of Arts and Sciences expressed a commitment to excellence that sent a message to the nation's citizens, and to the world, about the new country's confident aspirations.

Writing from France to his wife Abigail in May 1780, John Adams said, "I must study Politicks and War that my Sons may have liberty to study Mathematicks and Philosophy. My Sons ought to study Mathematicks and Philosophy, Geography, Natural History, Naval Architecture, Navigation, Commerce and Agriculture in order to give their children the right to study Painting, Poetry, Musick, Architecture, Statuary, Tapestry and Porcelaine." Of course, poets and artists have always been among us. But Adams's quote expresses the truth that a country must have a sufficient level of wealth, stability, and security before large numbers of its citizens can engage in pursuits broader than the basic struggle for survival that war and politics – the substitute for war – address.

I was thinking about Adams's quote long before I learned that I would be giving these remarks. Back in February, I was asked to

serve on the Academy's national Commission on the Humanities and Social Sciences, a group formed in response to a bipartisan request from members of the U.S. Senate and House of Representatives. The commission, comprised of leaders from the arts, social sciences, and humanities, is charged with the task of making suggestions for how to "maintain national excellence in humanities and social scientific scholarship

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and education, and to achieve long-term national goals for our intellectual and economic well-being; for a stronger, more vibrant civil society; and for the success of cultural diplomacy in the 21st century." This charge is in keeping with the spirit of this Academy's founding, reinforcing the principle that the country's intellectual and cultural life are matters of national importance and that direct action should be taken to insure the health of both.

One might think that no such exhortations would be necessary, that it is self-evident that the values taught and promoted in the humanities and social sciences are critical to the maintenance of a civilized society. But we live in interesting and difficult times. The global economy is in a parlous state, with no relief in sight. Whole professions and industries are undergoing structural changes that leave no clear picture of what to expect in the coming years. Uncertainty reigns. In times like these, people look for answers and, sometimes, in their despera-

tion, feel it necessary to abandon cherished understandings and values, to look for fixes that appear easy.

One of the easy answers offered in our current panic has been to downplay the study of the humanities, in particular, in favor of so-called hard subjects. From K – 12 into college and postgraduate schools, the message has gone forth that math and the sciences are what really count. Economics, a

social science, today in thrall to quantitative analysis, has been given something of a pass because it is seen as a path to business school.

No one can deny the importance of math, science, and technology. America needs more homegrown engineers and scientists, and the available evidence indicates that our students lack the math and science skills of youngsters in other countries with whom they must compete for jobs and even for places in our own universities. But this is not an either/or proposition. Our students can be proficient in math, science, *and* the humanities. They must be. It is imperative in a globally competitive world that they be deeply and broadly (yes, liberally) educated. No aspect or expression of human insight and talent should be given short shrift. America's students need to draw from every form of creativity – arts, sciences, mathematics – to put them in the position to tackle the tough questions and to solve the difficult problems that inevitably await us as the years unfold.

There is no need to reverse course, to go back to the age of soldiers and politics in which Adams found himself and his country in 1780. As he and others had hoped, through many years of struggle and achievement, we have become a great nation. Despite our current travails, we have the resources – if we choose – to realize the dream of a society where art, science, and mathematics – all forms of human inquiry – are valued and supported. As a member of the Commission on the Humanities and Social Sciences and as a member of the Academy, I hope to help make the case for the kind of liberally educated society that Adams championed. America's future as one of the leaders of the world depends on the complete realization of that vision.



William I. Miller

William I. Miller is President of The Wallace Foundation. He was elected a Fellow of the American Academy in 2008.

Why Bridges Matter – in Public Works and in Public Life

On our way here, my wife Lynne and I drove over the Anderson Memorial Bridge that links North Harvard Street in Allston with JFK Street in Cambridge. This three-arch bridge over the Charles River, made of reinforced concrete, is not especially large or long. At 440 feet, or about a tenth of a mile, it takes less than fifteen seconds to cross in a car. So it's easy not to give it a second thought.

But if you take a closer look, you might observe that in 1913, the engineering firm of Wheelwright, Haven & Hoyt took pains to cover the concrete in rather handsome brickwork, giving it a Georgian Revival character that ties it visually to the Harvard University buildings on the Cambridge side. You might see a small plaque erected by the

bridge's donor, Larz Anderson, in memory of his father, expressing the hope that the bridge will serve a high purpose. In fact, through careful placement and durable design, the bridge has united the people of two communities for nearly a century.

There are other kinds of bridges that are easy to overlook, that are difficult to build and sustain, and that also play an important public role. By that, I mean "bridging institutions" like the American Academy of Arts and Sciences that connect those with different perspectives and roles on behalf of some common, public purpose. This bridging purpose is visible today in the breadth of disciplines the Academy represents, in the ways in which it shares ideas externally through *Dædalus*, and in its inclusion of Class V members from public affairs, business, and administration, on whose behalf I am honored to speak today. Let me share three stories about how bridging institutions can make a difference.

I have spent most of my life in Columbus, Indiana, a small city of about 44,000. For many years, the main route to Columbus was through a nondescript, congested stretch of four-lane highway. In the 1990s, a number of us decided to try to make improvements, forming a group of local officials and community leaders called The Front Door Project. We wanted an entry that, like the Anderson Bridge, would help establish a sense of place to reflect our community values of innovation and striving for excellence. We brought in experts from outside the community: architects Robert Venturi and Denise Scott Brown to help us rethink how a commercial strip looks and functions, landscape architect Michael Van Valkenburgh to design a greenspace, and bridge designer Jean Muller of Switzerland. For the interstate bridge, Muller proposed a radical new design in which the roadbeds of Interstate 65 were cantilevered on the outside of a cable-stayed structure.

The effort took more than a decade. It made me realize how hard it is to build bridges and connections. After five years of little progress, I took to calling our group The Eternal Door Project. But persistence pays off. Today if you visit Columbus you will be carried into our downtown over two stunning and innovative bridges, between which are a vigorous commercial center and a dramatically landscaped parkway. More recent community initiatives have similarly strengthened the regional public education system and revitalized our downtown. I believe that all these efforts were successful because we assembled the critical ingredients of public-private partnerships – in other words, bridging institutions.

Meanwhile, The Wallace Foundation in New York City, whose presidency I assumed in July, has been trying to tackle the national challenge of strengthening how school principals are trained and supported to become instructional leaders. This also was not easy. Conventional wisdom held that principals were mainly responsible for the three Bs: buildings, budgets, and buses. Today, after eleven years of effort, improving school leadership is a federal priority. Leading districts across the country are creating promising new ways of preparing and supporting principals. Here, too, bridging made the difference: the Foundation brought together researchers, who generated objective evidence that effective principals are crucial to school improvement; policy-makers, who passed new laws; and practitioners, who developed ways to improve their practice. The Foundation is helping share the lessons as widely as possible.

Closer to the Academy, Tufts University professor Christine Economos spearheaded a citywide effort in Somerville, Massachusetts, to combat childhood obesity among first through third graders by combining the efforts of government, educators, restaurant

and gym owners, and volunteers. Shape Up Somerville yielded a modest but statistically significant reduction in the BMI (body mass index) among the city's young children between 2002 and 2007. The influence of this kind of bridging activity is spreading. The Healthy Communities Initiative back in my hometown is now working with Professor Economos to replicate the Somerville program in Columbus.

Let me offer a few thoughts on why these and other institutional bridges matter and what makes them work.

What makes bridging institutions work? Drawing on research from John Kania and Mark Kramer as well as my own experience and that of The Wallace Foundation, here is a short list:

- A shared agenda and approach, with metrics based on agreement about what success looks like;
- The development of trust among partners who closely coordinate their actions;
- Persistence over a long time frame; and
- A team to plan, manage, and support the effort.

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Bridging institutions respond to and are the best hope to counter the tendency of people in power or seeking power to pursue a narrow agenda.

The problems we face today – whether reducing childhood obesity, strengthening public education, or improving economic opportunity – tend to be complex and complicated, with few “silver bullets.” That means we need everyone’s best thinking and perspectives, from the Ivory Tower to Main Street.

Second, taking action on these problems will rarely be the province of one sector alone. In a time of strained fiscal resources, many believe governments are more likely to make progress when allied with other sectors.

Finally, we need bridging institutions because of the narrowing of political discourse and hardening of ideological lines. Bridging institutions respond to and are the best hope to counter the tendency of people in power or seeking power to pursue a narrow agenda. The key is to tap into the strength of diverse perspectives, thereby embracing the pluralism that is at the heart of our democracy.

Perhaps most important is a respect for the role of evidence and a willingness to acknowledge failure and learn from it, traits that great bridge designers share.

In other words, like bridges, bridging institutions need to be strategically placed, tied to the communities they represent, well designed, and there for the long haul. Partnerships for the public good are not easy to form; many of them fail. But the ones that work are among the most effective tools we have for social innovation and progress.

As you drive home, your route will likely take you over a bridge at some point. As you cross it, I would invite you to think of the words of Henry Petroski, the poetic and prolific professor of engineering and history at Duke University. Bridges, he said, “have become symbols and souls of cities.” Perhaps it is time we accorded their institutional counterparts some of that same affection and regard. Solving some of our most pressing problems may depend on it. ■